LIBRARY
MAY 20 1939
U.S. Department of Agriculture

306.8
Am3

Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

AMERICAN DYESTUFF REPORTER

AY 15, 1939
OLUME 28, NO. 10

FICIAL PUBLICATION
of the
PROCEEDINGS
ERICAN ASSOCIATION
TEXTILE CHEMISTS
AND COLORISTS

...speaking of Neutral dyeing Colors

if you haven't seen Leaflet 961 or tried Neutral Orange R X you really should get acquainted with this color.

Exhausting exceptionally well in a Neutral bath, Neutral Orange R X gives pleasing reddish shades of outstanding fastness to light as well as good general fastness properties.

Hosiery, Mohair Pile Fabric, Gloria, Pure dye Silk, Bathing suits and Union goods makers will all find great interest in the details and dyeings contained in Leaflet 961, and in particular, the fastness to light of Neutral Orange R X.

Please be sure that you have a copy of Leaflet 961 and a substance sample of Neutral Orange R X.

GEIGY COMPANY, INC.

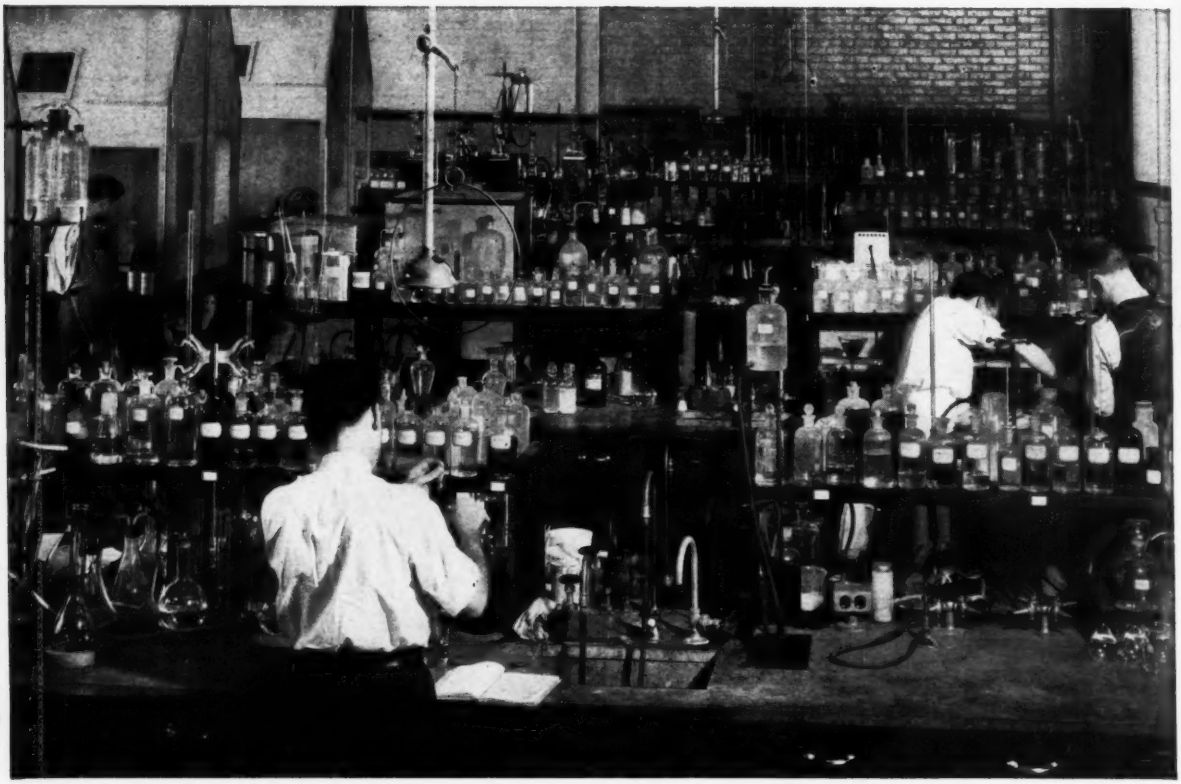
89-91 BARCLAY STREET NEW YORK—NEW YORK

Sole Selling Agents in
United States and Canada
for J. R. Geigy, S.A.
Basle, Switzerland

DYESTUFF MAKERS GEIGY EST. 1764

In Great Britain
The Geigy Colour Co., Ltd.
National Buildings
Parsonage, Manchester

Boston Providence Cincinnati Philadelphia Charlotte
Toronto Portland, Ore.



A section of the analytical laboratory, one of the many divisions that make the Stamford Research Laboratories of the American Cyanamid Company valuable to the industries using chemicals.

VARIETY IN CHEMICALS

FOR YOUR CONVENIENCE

You will find virtually every type of chemical required for textile production on Cyanamid's list . . . and many specialties developed for new or unusual applications. Let us show you how you can use these with profit. Our technical staff will be glad to work with you in demonstrating their effectiveness.

SULPHONATED OILS
PENETRANTS
SOFTENERS
SIZING COMPOUNDS
WETTING AGENTS

AMERICAN CYANAMID & CHEMICAL CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK, N. Y.
District Offices: 822 West Morehead St., Charlotte, N. C.; 89 Broad St., Boston, Mass.; 600 So. Delaware Ave., Cor. South St., Phila., Pa.

American Dyestuff Reporter, Vol. 28, No. 10, May 15, 1939. Published every other Monday. Copyright, 1939, by Howes Publishing Co., 440 4th Ave., New York, N. Y. Domestic subscription, $5.00; Canadian, $6.00; Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

AMERICAN DYESTUFF REPORTER

A. P. HOWES
Publisher

LOUIS A. OLNEY
Directing Editor

NORMAN A. JOHNSON
Managing Editor

MYRON D. REESER
Advertising Manager

Official Publication of the Proceedings of the American Association of Textile Chemists and Colorists.

MAY, 15, 1939

VOLUME 28 NUMBER 10

American Dyestuff Reporter, Vol. 28, No. 10, May 15, 1939. Published every other Monday. Copyright, 1939, by Howes Publishing Co., 440 4th Ave., New York, N. Y. Domestic subscription, $5.00, Canadian, $6.00, Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

Contents

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

• Special Articles

Impregnation of Textile Fibers with Rubber Latex..... 255
B. A. Harold

Present Uses of Logwood..... 260
H. R. Tisdale

Possibilities for Development of the Textile Industry In Texas 272
Hon. W. Lee O'Daniel and D. S. Culberson

• Departments

Book Reviews 273

Trade Notes—New Products..... 276

• Proceedings of the American Association of Textile Chemists and Colorists

Calendar of Coming Events.....P261

The Stability of Printing Pastes.....P262
Dave E. Truax

One Hundred and Twenty Second Council Meeting.....P264

One Hundred and Fifteenth Meeting of the Research Committee P265

Meeting, Rhode Island Section.....P266

Meetings, Northern New England Section.....P266

Meeting, New York Section.....P267

Meeting, Philadelphia Section.....P267

Unemployment Register P268

Copyright, 1939, Howes Publishing Co., Inc.

Holden and Stott, Architects

USING DYESTUFFS FOR *Fun* IS *Serious* BUSINESS

With good reason, International Parachuting, Inc. insisted on the finest of dyeing jobs for the eleven 'chutes for the "Life Savers" Parachute Tower at the New York World's Fair 1939. Colors had to duplicate as closely as possible those of "Life-Savers'" own gay candy products—by artificial light as well as by day. Another "must" was the ability to remain bright and clear throughout months of exposure to sun and weather. And all this had to be achieved with no possible risk of harm to the special parachute fabric.

Calco was asked to see the job through—and did. From shade-matching to delivery of dyes, formulae and instructions to the dyer himself.

And now, these gaily colored 'chutes are providing a new and thrilling kind of fun for Fair visitors. They are, too, tangible evidence of Calco's skill with dyes and chemicals—and of the kind of follow-through that helps make Calco dyes so satisfactory to use, whether the job calls for standard types or some tailor-made variation.

VISITING THE NEW YORK WORLD'S FAIR, 1939?

You'll want to enjoy the unique thrill of a ride on the "Life Savers" Parachute Tower.

For Color in Textiles it's

Calco

THE CALCO CHEMICAL COMPANY, INC.
BOUND BROOK NEW JERSEY

Boston · Philadelphia · Providence · New York · Charlotte
Chicago · Paterson · A Division of American Cyanamid Co.

AMERICAN
DYESTUFF REPORTER

VOLUME 28 MAY 15, 1939 NUMBER 10

Impregnation of Textile Fibers with

Rubber Latex

B. A. HAROLD

A STABLE, transportable rubber latex has been available for application to textiles from the standpoint of commercial plant practice for the past ten years. In this time much development work has been carried out for the purpose of producing a textile fiber which might be truly termed, "perfectly impregnated."

From a casual standpoint, the first impression formed is that this effect should not be difficult. There are present two colloidal bodies: (1) a fibrous mass, either cellulosic or proteinous and (2) the rubber hydrocarbon, the latter supposedly dispersible in the former. At the present writing, however, rubber technologists do not affirm the presence of any textile fiber in which there exists the rubber hydrocarbon dispersed from rubber latex into the micellar structure of the fiber. They do, on the other hand, accept the micellar dispersion of rubber into a fiber-like cellulose from a volatile solvent solution (such as benzine) of the rubber.

The question now arises as to why a textile fiber perfectly impregnated with rubber has been so eagerly sought. The answer is that while the extra strength and elasticity added by rubber to a fiber are decided assets, the harshness, tackiness and drag of a rubber surface, which latex leaves when deposited upon the external surface of a fiber, are objectionable.

The research work which has been done along the above lines has proved interesting, and the writer will review in the following the three lines of approach which have been pursued for producing a well, but not perfectly, impregnated textile fiber from rubber latex.

Bongrand's[1] approach was from the "dyeing" standpoint. He attempted to ascertain the optimum conditions which favored good dyeing, which, after all, involved similar conditions, i.e., the exhaustion of one colloidal body (dyestuff) within the micellar structure of another body (fiber).

It was found that the waxes, gums and fats found present in unwashed and unbleached cotton fibers offered resistance, which had to be overcome by kier boiling and bleaching. Tightly twisted threads hindered impregnation, and Bongrand found tight twisting to be unnecessary as the rubber subsequently bound the fibers as well as twist together.

It was erroneous on Bongrand's part to compare a latex bath with a substantive dyebath as they differ in one fundamental respect—their coagulability. A dyestuff when coagulated from solution by an electrolyte still possesses a particle size which is apparently less than the fiber interstices and, therefore, does not hinder further penetration by other dye micelles. With rubber latex, on the other hand, it was found that every factor which promoted coagulation at the point of contact with the fiber acted in opposition to further penetration. A film of rubber was found to be a much greater obstacle than the original pectin wax and fat, and to effect proper penetration it was necessary to prevent the formation of the rubber films.

Bongrand noted that the pH of the moisture found in textile fibers was acidic—pH 3.5 to 4. This was a disadvantage inasmuch as acid will readily coagulate the average Hevea type of latex. Hence, the greater the penetration of latex into a fiber, the greater the tendency to coagulate with film formation. It was observed that when the pH of the latex bath which is around 11.4 and that of the fibers had the same or nearly the same value, then conditions were most favorable for impregnation. This could easily be carried out by changing the pH of the fibers to that of the latex with proper alkaline compounds. In the case of Funtimnia latex which is stable to acid the adjustment is simpler, as the pH of the latex is adjusted down to that of the fiber.

Bongrand's experiments resulted in the production of a new textile thread known as Filastic. Its advantages over elastic threads lay in the fact that (1) the rubber which might consist of 50 per cent of the impregnated thread was uniformly distributed from center to outside, (2) it did not possess the tack of other threads, and (3) it could be woven without difficulty as it was perfectly dry.

The principal features of the Filastic Process are:

(a) Prolonging the time of contact of the latex and

textile thread which is indispensable for perfect impregnation.

(b) Overcoming the tendency of the latex to drain away.

(c) Fixing the latex on the fibers by means of an operation which is termed "maturation."

The spools of thread are placed on a spindle on a disc which rotates in a vertical plane. As a result of this rotation, any latex which tends to drain away is absorbed again by the spool. The latex is kept in a liquid state by rotating the spool in a moist ammoniacal atmosphere kept at a controlled concentration. The penetration of the latex amongst the fibers proceeds during this first stage of the maturation process.

The second phase of the process depends upon the fact that between the original state of dispersion of the rubber in the latex and its final stage of coagulation, there is an intermediate state, the "gel" state. Here the rubber remains immobilized on the fibers and no longer separates from the latter. At this stage, the impregnated spool can still be unwound, an operation which could not be done were the rubber already coagulated. When the spool is unwound, the thread is passed through a coagulating bath, and the rubber gel is converted into a true coagulum. The contraction which takes place by reduction in the diameter of the thread completes the penetration of the rubber among the fibers.

An interesting property of this thread is that when dry it absorbs rubber latex very readily. Thusly, it may be given a second impregnation whereby more rubber or any other substances may be added which will modify the chemical, physical or mechanical properties imparted by the first impregnation.

Products made from the Filastic thread, such as fish nets, shoe laces, tennis nets, braided hose, as well as conveyor and transmission belting, are claimed to be impermeable, rotproof, moldproof and highly resistant to abrasion.

The second approach to a perfectly impregnated fiber was made by Stevens and Stevens[2], whose ideas involved the incorporation of materials into rubber latex which would offset the disadvantageous properties of the average latex finish. They produced a fiber which was free from tack, and in doing so concluded that although the true impregnation of cellulose by rubber latex appeared unlikely, it could not be ruled out altogether. They pointed out that previous work on the so-called impregnation of cotton threads was a coating process and not one wherein rubber was deposited within the interstices of the fibers.

From a theoretical standpoint, Stevens and Stevens stated that cellulose, like rubber, was an inert substance of colloidal nature and indefinite constitution. The impregnation of one colloid by another (cellulose by rubber) was unlikely for a colloidal membrane will hold back colloidally dissolved materials while allowing crystalloids to pass. Cellulose and rubber are different types of colloids as the former is normally hydrophyllic, while the latter takes up organic solvents more readily. Rubber does have the power, however, of absorbing some moisture which probably results from the crystalloidal and other impurities contained in raw rubber, as the purer the rubber, the less the moisture absorbed.

Stevens and Stevens attempted to produce a cloth, which after being impregnated with latex, would show a minimum degree of tack. One interesting point was proved in their research and this was that cloth when treated with a vulcanized latex-starch mixture and subsequently soaped and washed was not as tacky as cloth impregnated with an unvulcanized latex-starch mixture. It was shown, however, that the vulcanization of the latex did not improve the wash fastness of the finish. The results of the latter tests are shown in Table I.

TABLE I

Comparison of Percentage of Latex Finish Removed by Washing

Composition of Finishing Mixture	*Percentage Dry Finish on Cloth*	*Percentage of Finish Removed by Washing*
Latex—Soluble Starch Mixture (Unvulcanized)		
30% Solution Soluble Starch	27.1	100
50 cc. Solution Soluble Starch + 2.5 cc. Latex	28.4	92.5
50 cc. Solution Soluble Starch + 10 cc. Latex	26.5	83.5
50 cc. Solution Soluble Starch + 50 cc. Latex	31.4	33.5
50 cc. Solution Soluble Starch + 250 cc. Latex	28.7	19.5
Latex alone	32.8	7.0
Latex—Soluble Starch Mixture (Vulcanized)		
30% Soluble Starch Solution alone	27.1	100
50 cc. Soluble Starch Solution + 2.5 cc. Latex	27.5	98.0
50 cc. Soluble Starch Solution + 10 cc. Latex	29.4	74.5
50 cc. Soluble Starch Solution + 50 cc. Latex	32.8	48.5
50 cc. Soluble Starch Solution + 250 cc. Latex	34.9	27.0
Vulcanized Latex alone	34.3	6.8

The two investigators evolved a finish upon cotton cloth which was free from tack, by incorporating a wax in with the latex. This was carried out as follows:

Paraffin wax was emulsified with triethanolamine stearate, and the emulsion mixed with latex in various proportions. Cloth samples were padded three times with this mixture, while drying the cloth after each padding. It was found that not only did the wax remove the tack but the presence of the vulcanized rubber in the finish retarded the extraction of the wax in dry cleaning, a disadvantage possessed by straight wax finishes. The addition of China clay to the wax-latex emulsion was found to increase the resistance of the finish to benzene solvent. The retardation of wax removal by the rubber from the cloth while being subjected to six successive treatments with benzene is shown in Table II.

TABLE II

Retardation of Wax Removal By Rubber

% Wax on Dry Rubber Content of Finishing Mixture	*% Initial Dry Finishing Materials Removed After Six Successive Treatments with Benzene*					
Pure Wax Finish..	92.0	100.0	—	—	—	—
250	56.0	70.5	79.5	83.0	84.0	85.0
140	37.2	47.5	51.2	56.5	58.2	66.2
100	26.0	33.5	34.5	39.0	41.2	45.7
80	24.0	30.0	40.0	43.0	45.0	48.0
40	18.7	19.2	19.6	24.0	24.7	25.2
Pure Latex Finish.	2.1	2.1	2.1	4.0	4.5	5.9

The third approach to a perfect latex impregnated textile fiber was attempted by Blow[3], who worked with wool fibers. His angle of approach was purely from the standpoint of the electrical charges possessed by the various bodies present, and varying these in order to produce a state of optimum attraction.

Blow maintained that in the usual coagulation methods wherein rubber is deposited upon the fiber there does not occur true deposition, as the rubber hangs but to the outside of the fiber. He therefore attempted to produce a true state of adsorption between fiber and rubber particle.

It was realized that inasmuch as the particles in rubber latex are negatively charged, good deposition of the rubber would occur if a strongly positive surface were presented. A soluble compound, which, when in solution was strongly positive, had to be sought; one which would be strongly adsorbed by wool, and thus render it positive. Secondly, it would be necessary that the compound be mutually adsorbed by both the rubber and the fiber and thereby serve as a bonding agent. Blow found that the new cationic soaps constituted compounds of this nature.

Recent textile literature[4] has offered detailed description of these new compounds, which lend unusual softening properties to textile fibers. Unlike regular soaps wherein the positive ion is the metal (sodium or potassium), and the negative ion or anion is the long chain constituent, cationic soaps contain the latter as the positive ions with halides or sulfates as the anions. The hydrophilic group (cation) of these soaps which is attached to the long chain of carbon atoms is a quaternary ammonium, sulfonium or phosphonium group. Typical cationic soaps are cetylpyridinium bromide and dodecyltrimethylammonium bromide.

Cationic soaps are strongly adsorbed by textile surfaces and by reason of the positive charge of the adsorbed long chain ion render the surface of the fibers positively charged. On immersing fibers treated with one of the cationic soaps into a rubber latex solution consisting of negatively charged particles, deposition of the rubber occurs. As the molecule of the soap contains an aliphatic chain which is soluble in the rubber, there occurs a true bond between the fiber and the rubber. Thusly, the four properties possessed by cationic soaps which encourage this true adsorption are:

(1) A positively charged adsorbable ion.
(2) A group adsorbed by textile surfaces.
(3) A group soluble in the rubber hydrocarbon.
(4) They possess good wetting properties.

Blow showed that the deposition of the rubber was definite and irreversible as the fibers could be rinsed without appreciable loss of rubber. The results of his experiments are shown in Table III.

TABLE III

Rubber Content

Latex Treatment of Fabric	*Untreated Wool*	*Wool Pretreated with Cationic Soap*
Immersed in 5% Latex, squeezed and dried.....	3-4%	12%
Immersed in 5% Latex, washed and dried.....	0.25%	10%

It is interesting to note that Blow was able to take a negatively charged rubber latex, render it positive by the introduction of a cationic soap, and truly deposit the rubber therefrom upon a wool fiber. Pieces of wool fabric, before and after chlorination were immersed in latices of 5 per cent dry rubber content for 30 minutes, removed and washed, squeezed, hydro-extracted and dried. As shown in Table IV chlorination markedly improved the adsorption properties of the wool, and it is evident that an alkaline latex is necessary for true deposition.

TABLE IV

Rubber Latex (5% Dry Rubber Content)

Stabilizer	*Particle Charge*	*pH*	*% Rubber in Fabric*	
			Unchlorinated	*Chlorinated*
None	Neg.	Alkaline	0	0
Cationic Soap	Pos.	Alkaline	6.0	11.5
Cationic Soap	Pos.	Acid	Trace	1.9

One of the best approaches to the problem of true fiber impregnation by rubber latex was made by Hauser and Hunemorder[5].

In their experimental work, cotton threads were immersed in gelatin, which was frozen with CO_2. Fine

sections were cut by means of a microtone. In order to determine whether true impregnation had occurred, these sections were immersed in concentrated sulfuric acid, followed by a rinse. Thusly, any unimpregnated and exposed cotton was destroyed by the acid, while the latter rendered the rubber a reddish-brown color. The results were then ascertained by photomicrographs.

Hauser and Hunemorder found that a thorough impregnation of the fiber could never be attained with latex as the rubber was merely deposited on the surface. Rubber in a benzene solution, on the other hand, impregnated a cotton fiber almost perfectly. The reason for this was that, "The rubber hydrocarbon contained in the latex is present in the form of an endless number of minute particles whose average diameter is estimated at 1 to 2 μ. When we consider that the capillary interstices of the fibrous tissue are considerably smaller than these particles, it follows that the latex particles cannot penetrate into the interior of the thread, but at best the aqueous dispersing medium of the latex is absorbed by the core."

The question which now remains is—why does rubber in a benzene solution impregnate ~~rubber~~ perfectly? The answer of the above two investigators is as follows:

During the process of vulcanization rubber exhibits a more or less pronounced flow effect varying in degree with the physical condition of the rubber. Rubber which has undergone no mechanical treatment before vulcanization (like rubber latex) exhibits scarcely any flow effect at all. Rubber which has been pre-kneaded by mastication exhibits flow effect in proportion to the degree of mastication. Similarly rubber obtained by evaporation of a benzene rubber solution exhibits flow effect to a degree practically equal to that of a strongly masticated raw rubber.

Thusly, upon vulcanization, rubber in the form of a benzene solution due to its marked flow effect produces a more or less perfect impregnation of a fibrous mass, whereas latex, due to the absence of this flow property, effects a mere external coating.

From a practical standpoint, the writer has observed that there are two factors which aid thorough and uniform impregnation of textile fibers: (1) presence of an efficient wetting agent in the latex bath and (2) presence of dispersing agent which will yield a fine dispersion of the compounding ingredients in the latex.

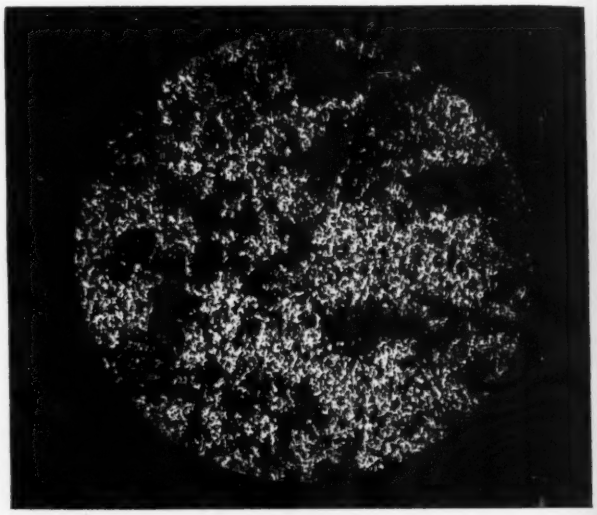
As we well know, many wetting agents have been offered as dispersing agents, and while many of these are effective dispersants, this does not hold true for all wetting agents. This has been shown by the following set of experiments[6], the results of which clearly indicate that some wetting agents actually produce flocculation of suspensions.

In these tests, a series of eight mixtures consisting of 5 parts of red iron oxide and 150 parts of water were prepared by stirring the pigment and water together with a glass rod. 0.5 part of six different commercial wetting agents was added to each of these mixes. Darvan, which is a polymerized organic salt of sulfonic acids of the alkyl aryl type[7] was added to the seventh mixture. It may be emphasized that this compound does not reduce the surface tension of water, and thusly possesses no wetting action, and has been advanced as a true dispersant. After the mixtures were agitated vigorously, a drop of each was placed on a microscopic slide, the excess liquid drained off, the spot allowed to dry and photomicrographs taken.

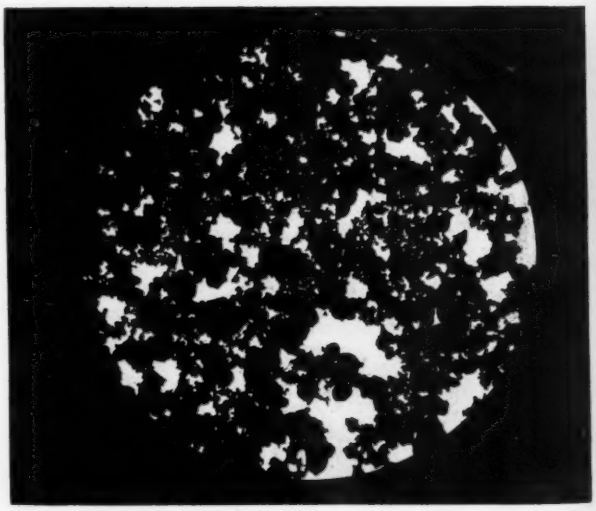
Figure I shows these photomicrographs which depict the dispersions ranging from pure water to Darvan. It will be observed that Wetting Agents A, B, C and D actually have produced coagulation when compared with the dispersion in pure water. Wetting Agents E and F tended to improve the dispersion, while Darvan has produced a fine uniform dispersion.

Before concluding it may be well to discuss the reason for the importance of rubber latex development in conjunction with textiles. It is a known fact that wherever increased toughness, elasticity and wearability has been

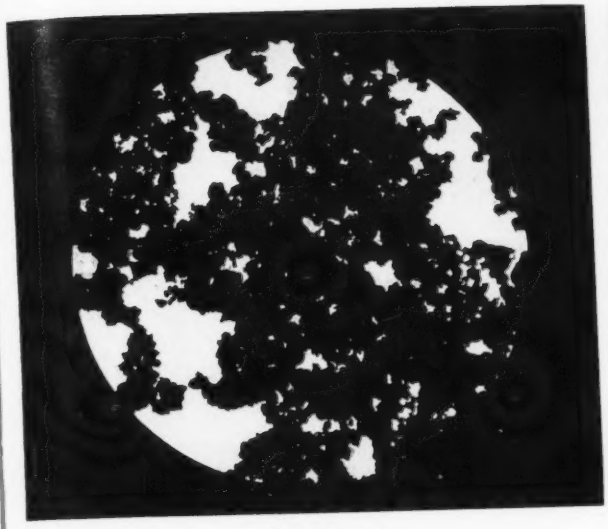
FIGURE 1



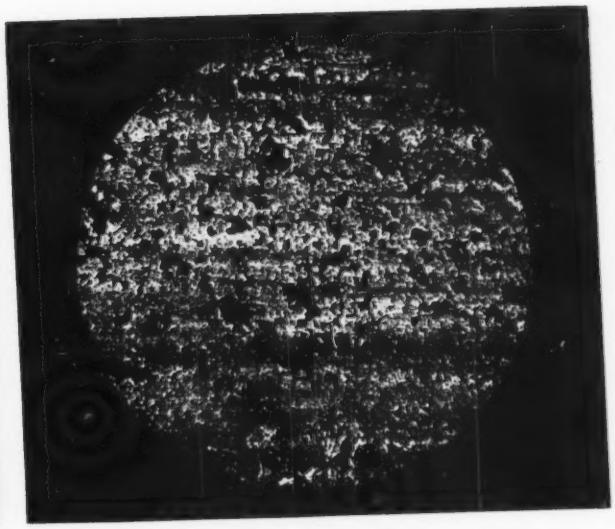
Pure Water



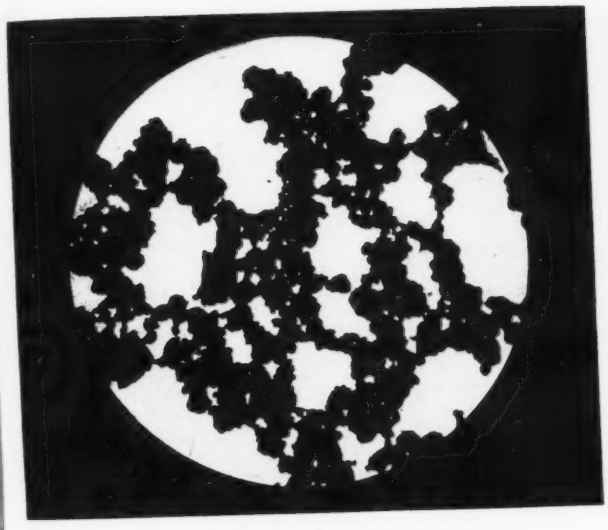
Wetting Agent A



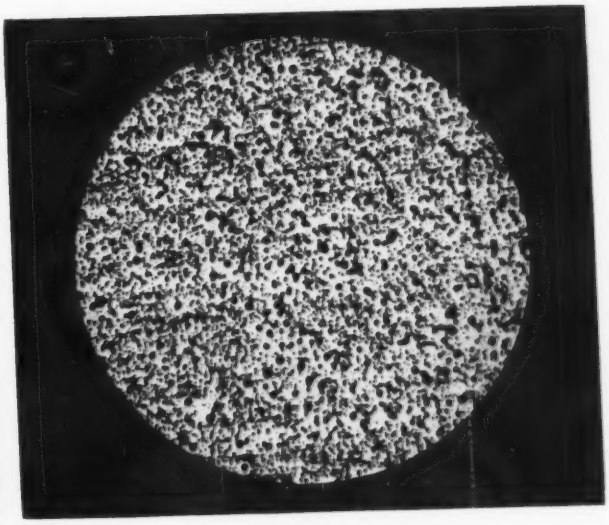
Wetting Agent B



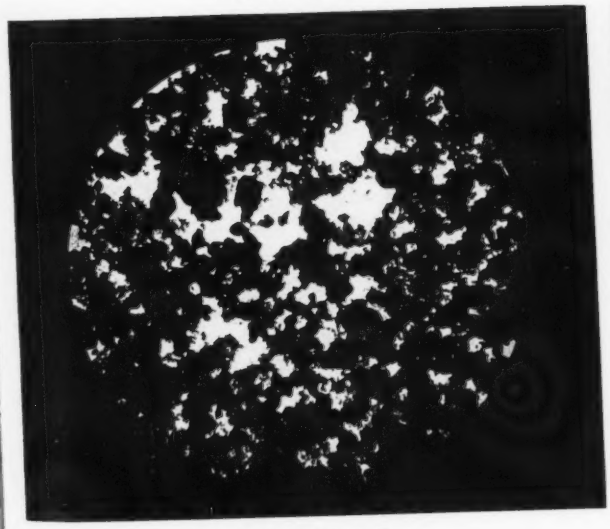
Wetting Agent E



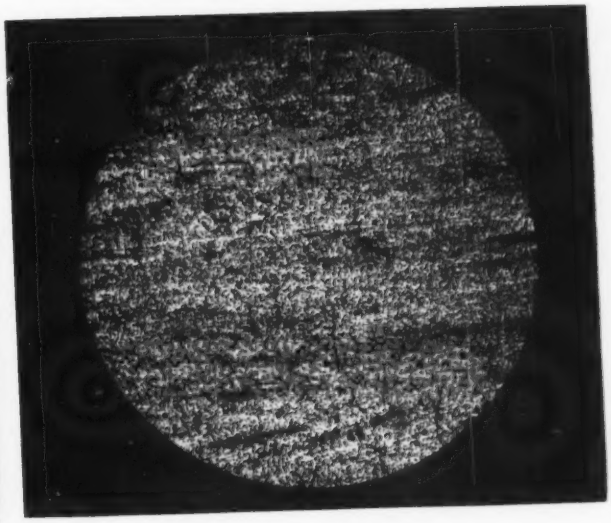
Wetting Agent C



Wetting Agent F



Wetting Agent D



Darvan

sought for in fibers, these effects can usually be obtained by use of rubber latex. Let us take, for example, the case of crease resistant textiles produced from urea formaldehyde resins. If the more recent foreign patents are examined, it will be found that increased wearability in these fabrics are attained by use of rubber latex. This has been brought out in the two following patents:

British Patent No. 486,926[8] issued to Tootal, Broadhurst, Lee Co., Ltd., describes textile materials rendered crease resistant by the presence of synthetic condensation products which have their *wearing* properties improved by treatment with natural or artificial rubber latex before, during or after the synthetic condensation product treatment. Examples:—

A urea-formaldehyde precondensate is mixed with rubber latex and ammonium phosphate. The textile material is impregnated with this mixture, squeezed, dried and heated to 120° to 130° C. for 2-3 minutes. The product is claimed to be crease and wear resisting.

A later British patent[9] issued to Botson, Perlmuteer and Raepsaet is very much along the same lines. Here the fabric is first impregnated with rubber latex containing a wetting agent, from the alkylated napthalene sulfonic acid series, dried and treated with a solution containing 5 parts urea, 25 parts 40 per cent formaldehyde, 2 parts lactic acid and 60 parts water. The fabric is dried and then heated for 10 minutes at 150° C.

Two other patents, one illustrating the water-repellency of rubber latex and the other its property of rendering an openly woven textile dustproof and waterproof prove interesting.

In the first[10] a knitted fabric of cellulose acetate is treated with a solution which comprises a dispersion of ammonium stearate in rubber latex at a temperature of 25° to 35° C. The material is removed, hydro-extracted and dried. The ammonium volatilizes in drying, leaving the water repellent stearic acid and rubber in the fabric.

In the second development[11] jute fabrics for making bags for the packing of raw cotton and wool are coated on one side with a vulcanizable rubber latex. The purpose of the rubberizing is to prevent damage to the contents of the sacks from water, as well as to prevent dirt and dirty goods from penetrating the fabric. The strengthening properties of the latex give longer life and wearability to the sacks by increasing the tensile strength of the fabric.

In the foregoing we have considered the study of two groups of colloidal bodies, rubber latices and textile fibers, from the standpoint of producing a fiber which has been perfectly impregnated by the latex. It is apparent that the molecular aggregates of latex are of such size that they do not permit true impregnation. However, methods have been devised by which the disadvantageous properties of a "rubber surface" may be eliminated.

ACKNOWLEDGMENT

We wish to thank Dr. Russell of the R. T. Vanderbilt Company for his permission to reproduce the photomicrographs shown herewith.

BIBLIOGRAPHY

[1]Bongrand (Rubber Chem. and Tech. *11*, 538, 1938).
[2]Stevens and Stevens (Trans. of Inst. Rubber Chem. *11*, 67, 1935).
[3]Blow (Jour. Soc. Chem. Ind. *57*, 116, 1938).
[4]Textile Colorist *59*, 257, 1937.
[5]Hauser and Hunemorder (Rubber Chem. & Tech. *5*, 685, 1932).
[6]Vanderbilt News *8*, 16, 1938.
[7]Van Antwerpen (Ind. & Eng. Chem. *31*, 67, 1939).
[8]British Patent No. 486,926, Tootal Broadhurst Lee Co., 1938.
[9]British Patent No. 490,135, Botson, Perlmuteer & Raepsaet, 1938.
[10]J. Nusslein, Chem. Abstracts *32*, 6884, 1938.
[11]Jute Bags, Woodhouse and Brand, p. 175, 1938.

Present Uses of Logwood

H. R. TISDALE*

A CAREFUL perusal of latest books on dyeing reflects an almost utter lack of knowledge of, or interest in the subject. If it is mentioned, it seems to indicate a state of mind of the author that, while Logwood was used many years ago, at the present time it is of little importance and is of only historical interest.

Many of the older authentic books on dyeing do devote considerable space to the subject, and interested students can find many chapters on the Natural Dyewoods, and particularly on Logwood, in such books as "A Manual of Dyeing" by Knecht, Rawson and Lowenthal, and "Application of Dyestuffs" by Matthews.

*American Dyewood Co.

In this short article an attempt will be made to give the reader some present day applications of Logwood, and leave it to his judgment as to whether Logwood is a back number in the present every day scheme of the dyeing industry.

WOOL

One of the largest industries using Logwood at the present time is that of wool. Since blacks and greys are stable colors in the wool trade, and since Logwood is only used for dyeing a black on wool, there is always a potential demand. If light grey shades are the vogue, naturally the amount of Logwood used varies, since grey is a combination of black and white.

(Continued on page 269)

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

MAY 15, 1939

Officers of the Association

ALBAN EAVENSON, *President*
Eavenson & Levering Co., Camden, N. J.
DUNCAN FERGUSON—ARTHUR R. THOMPSON, JR., *Vice-Presidents*
WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline & Chemical Co., Boston, Mass.
HAROLD C. CHAPIN, *Secretary*
Lowell Textile Institute, Lowell, Mass.
LOUIS A. OLNEY
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

Councilors Representing Sections

FREDERIC A. PRISLEY; PETER J. ARIENTE (Rhode Island)
HERBERT S. TRAVIS; CHARLES A. SEIBERT (Philadelphia)
HENRY F. HERRMANN; GEORGE L. BAXTER; HAROLD W. STIEGLER, (New York)
DEXTER R. KNEELAND; WALTER M. SCOTT (N. New England)
RAPHAEL E. RUPP; THOMAS R. SMITH (Piedmont)
P. N. COLLIER (South Eastern) B. C. BLOWNEY (Midwest)
HOMER WHELCHEL (South Central)

Local Sections and Their Officers

Northern New England Section
Clarence L. Nutting, Chairman, Arlington Mills, Lawrence, Mass.
John N. Dalton, Secretary, Pacific Mills, Worsted Division, Lawrence, Mass.

Rhode Island Section
Allison R. Fletcher, Chairman, Franklin Process Co., Providence, R. I.
Louis D. Fleming, Secretary, Woodlawn Finishng Co., Pawtucket, R. I.

New York Section
Louis S. Zisman, Chairman, Gotham Silk Hosiery Co.
33rd St. and 1st Ave., New York, N. Y.
P. J. Kennedy, Secretary, E. I. duPont de Nemours & Co., Inc.
61 Thomas St., New York, N. Y.

Philadelphia Section
William Ebersold, Chairman, 1512 Sheridan Lane, Norristown, Pa.
James P. Conaway, Secretary, 5947 Belden St., Frankford, Philadelphia, Pa.

Piedmont Section
A. Henry Gaede, Chairman, Laurel Soap Mfg. Co., Charlotte, N. C.
J. W. Ivey, Secretary, Mathieson Alkali Works, Inc., Charlotte, N. C.

South Central Section
Nestor Groteluеschen, Chairman, Magnet Mills, Clinton, Tenn.
W. S. McNab, Secretary, Quaker City Chemical Co., Knoxville, Tenn.

Midwest Section
Herman Boxser, Chairman, Western Felt Works, 4115 Ogden Ave., Chicago, Ill.
David Anderson, Secretary, Nyanza Color & Chemical Co.,
549 West Randolph St., Chicago, Ill.

South-Eastern Section
Robert W. Philip, Chairman, Editor, "Cotton," Atlanta, Ga.
W. Fred Crayton, Secretary, E. I. duPont de Nemours & Co., Inc., Columbus, Ga.

Lowell Textile Institute Student Section
Vernon W. Colby, Chairman; William B. Prescott, Secretary.

North Carolina State College Student Section
W. L. Carter, Chairman; Seymour Schandler, Secretary.

Philadelphia Textile School Student Section
Newton Monschein, Chairman; Bernard Menin, Secretary

Members should notify the **Secretary** immediately of all address changes

CALENDAR OF COMING EVENTS

Meeting, New York Section, Swiss Chalet, Rochelle Park, N. J., May 19, 1939. Speaker: Dr. Jerome Alexander.

* * *

Meeting, Southeastern Section, Atlanta Athletic Club, Atlanta, Ga., May 20, 1939. Speakers: Dr. F. Bonnet, American Viscose Co., Thomas H. Quigley, Georgia School of Technology.

* * *

Outing, Rhode Island Section, Pawtucket Golf Club, June 9, 1939.

* * *

Outing, Philadelphia Section, Whitemarsh Country Club, June 9, 1939.

Council meeting, New York City, 9:30 A.M., June 16, 1939.

* * *

Outing, New York Section, North Jersey Country Club, Paterson, New Jersey, June 16, 1939.

* * *

Outing, Piedmont Section, Ocean Forest Hotel. Myrtle Beach, S. C., June 23 and 24, 1939.

* * *

Annual Meeting, Boston, Mass., September 15 and 16.

The Stability of Printing Pastes*

DAVE E. TRUAX**

THE stability of a printing paste includes any changes that may take place in the physical character and the chemical composition of the paste. The most important changes in the character of the paste will be changes in the viscosity and texture, while the chemical changes will include decomposition of both color and chemicals.

The importance of stability of pastes is obvious to anyone in the printing industry. If the viscosity should change during the run, the penetration of the color, as well as the entire character of the print, may be affected. In some cases the paste may thin out so badly that it will have to be returned to the color shop for dry gumming, or it may have to be discarded entirely. On the other hand, pastes that have jelled will have to be broken down before using, causing delays in both the print room and the color shop. The many printing defects, such as mottled, mealy, or rough prints, are usually caused by changes in the texture of the gum, as no colorist will deliberately start a job with a gum that is obviously grainy, mealy or livery. And, of course, the easiest way to encounter claims due to shaded prints is to have the chemical composition of the paste change during the run.

The changes in viscosity can easily be measured by the Stormer Viscosimeter, using the method developed by Dr. Glarum and Dr. Gleysteen in their work for the Association. The one point that is not shown by this test is the amount of jelling that occurs, as the first reading is taken only after the jell has been completely broken by repeated tests at the maximum load. However, we have found that at least an indication of the amount of jelling in a paste may be shown by the difference between the first reading, at the maximum load, and the final reading taken at this load when check results are obtained. This method will be in error, due to the partial breaking of the jell in preparing the paste for the test, but the results will at least show the difference between a stable paste and one that jells badly. We have not seen any method of evaluating the texture of a paste, other than visual examination.

The first ingredient of a paste to be studied, would naturally be the thickener. In general, starches have a tendency to increase jelling—whereas gums decrease jelling. And with an all-gum formula, the starchier the gum, the more it will jell, and the further the gum has been converted, the less it will jell. However, satisfactory pastes can be made with a large proportion of starch to gum, by judicious choice of the type of starch. Thus, a Rapidogen paste, made up of a starchy gum and corn starch, will jell very badly, while the same type of gum made with tapioca, will show very little change on standing. The following figures from Stormer tests will illustrate the difference:

Comparison of Tapioca and Corn Starch in Rapid Gums

	Fluidity @ 23½° C.			
	Gum and Tapioca		*Gum and Corn Starch*	
Load	*Fresh*	*One Day Old*	*Fresh*	*One Day Old*
1000 (1st)	0.00205	0.00181	0.00346	0.00208
1000	0.00216	0.00230	0.00385	0.00394
800	0.00170	0.00184	0.00275	0.00269
600	0.00114	0.00114	0.00132	0.00114
400	0.00053	0.00054	0.00028	0.00022

The first readings—at 1000 grams—indicate that, before the jell has been broken, the fluidity of the tapioca paste has dropped about ten per cent, whereas the corn paste has dropped forty per cent. The remaining figures show that neither paste has changed appreciably in 24 hours, if the initial jell is broken. Thus, the proper selection of starches is very important, particularly for rapid colors, where the use of highly converted gums would cause a distinct loss of color value.

Since caustic soda, in varying amounts, is always used with rapid colors, this factor must be considered in choosing the thickener. As all starches have a tendency to go rubbery with caustic alkalies, it is necessary to add some gum to the starch. This may be either a starchy gum with very little reducing value, or it may be a natural gum. If the latter is chosen, allowance will have to be made for the thinning action of the alkali on the gum—as shown by the following tables.

Effect of Caustic and Color on a Starchy Gum—Starch Paste

	Fluidity @ 23½° C.			
		Color		
Load	*Paste*	*1 Hour*	*24 Hours*	*48 Hours*
1000	0.00216	0.00510	0.00549	0.00541
800	0.00170	0.00446	0.00477	0.00474
600	0.00114	0.00362	0.00388	0.00369
400	0.00053	0.00289	0.00295	0.00287
200		0.00167	0.00170	0.00159

Colors made up with 4 oz./gal. Rapidogen Scarlet RS and 1 oz./gal. caustic.

*Presented at Meeting, Rhode Island Section, November 21, 1938.
**Stein Hall & Co., Inc.

Effect of Caustic and Color on a Starch—Trag Paste

Load	Fluidity @ 23½° C. Paste	Color 1 Hr.	Color 24 Hrs.	Color 48 Hrs.
1000	0.00305	0.01020	0.01064	0.01282
800	0.00198	0.00899	0.00962	0.01157
600	0.00124	0.00757	0.00794	0.00986
400	0.00078	0.00526	0.00616	0.00796
200	0.00048	0.00385	0.00420	0.00544

Colors made up with 4 oz./gal. Rapidogen Scarlet RS and 1 oz./gal. caustic.

These tables show, not only the much larger drop in viscosity of the starch-trag paste on long standing when made up as printing color, but also show the much thinner color obtained with the starch-trag paste. This indicates that the thinning effect of the caustic must be considered, even if the color is to be used up in the first hour.

Although the caustic alkalies cause greater thinning of natural gums, the reverse is true when acids are used. This effect shows up particularly in the use of salt colors, where the paste will be acid, and will usually contain one or several metallic salts, such as aluminum chloride or zinc chloride, which also have a decided thinning effect on the starch paste. The following tables show the thinning obtained with various commercial thickening agents.

Locust Bean Gum—(4 oz./gal. Scarlet Salt R)

Load	Fluidity @ 17° C. Fresh	18 Hours @ 10° C.
1000	0.00714	0.01191
800	0.00456	0.00868
600	0.00295	0.00617
400	0.00216	0.00401
200	0.00179	0.00258

Starchy Gum—(4 oz./gal. Scarlet Salt R)

Load	Fluidity @ 17° C. Fresh	18 Hours @ 10° C.
1000	0.01163	.....
800	0.01157	.....
600	0.01118	.....
400	0.01029	0.05000
200	0.08847	0.05209
100	.....	0.04167

These results indicate clearly the advantages of the natural gum, but unfortunately it is not always possible to obtain satisfactory prints with an all gum formula. For this reason, the addition of some tapioca paste to the natural gum will prove advantageous, without lowering the keeping qualities excessively. However, in this case, it is advisable to cook the tapioca with an addition of two per cent neutral soap, and acidify the paste with acetic acid.

The effect of chromates in Indigosol and Rapidogen pastes is not so serious, but since chromium salts have a tendency to couple with starches, it is to be expected that thickening of the color pastes will be encountered. This effect may appear in a short time, or it may not show up for four or five days. The following Stormer tests, run at five day intervals, give an indication of the thickening that may be expected.

Effect of Chrome on a Starch Gum Paste (4 oz./gal. Rapidogen Bordeaux)

Load	Fluidity @ 23½° C. Plain Fresh	Plain 5 Days	2 Oz. Chrome Fresh	2 Oz. Chrome 5 Days
1000	0.00649	0.00833	0.00862	0.00735
800	0.00573	0.00718	0.00772	0.00625
600	0.00489	0.00552	0.00675	0.00490
400	0.00366	0.00362	0.00539	0.00331

This is more pronounced in heavier pastes, and can be almost eliminated by thinning the color slightly before allowing it to stand overnight.

The changes encountered in vat color pastes are much smaller, as the pastes usually contain a large percentage of highly converted British gum, and also because they are usually made up complete, except for the addition of dyestuff. Since the majority of the vat dyes have only slight effect on the printing pastes, they do not cause much trouble. However, the introduction of dispersing agents, etc., may cause a marked change in the printing paste. The effect of such a common dispersing agent as sulfonated castor oil on a British gum paste is shown by the following table.

Effect of Sulfonated Castor Oil on British Gum Paste

Load	Fluidity @ 23½° C. Plain	1% Sulfonated Castor Oil
1000	0.00709	0.00362
800	0.00609	0.00280
600	0.00453	0.00113
400	0.00253	0.00113
200	0.00057	0.00040

Both pastes are simply 12 ounces per gallon of British gum, to one of which one per cent of sulfonated castor oil was added before cooking.

The following tables show the effect on viscosity of dispersing agents, etc., actually encountered in a single type of vat color, as marketed by the several dyestuff companies.

Changes in Fluidity of 2BD Paste

Manufacturer A

Load	Fresh	Fluidity 2 Days	5 Days
1000 (1st)	.00366	.00368	.00385
1000	.00518	.00602	.00602
800	.00470	.00568	.00527
600	.00397	.00499	.00405
400	.00311	.00403	.00295

Manufacturer B

Load	Fresh	Fluidity 2 Days	5 Days
1000 (1st)	.00339	.00336	.00370
1000	.00495	.00562	.00510
800	.00448	.00527	.00398
600	.00366	.00466	.00244
400	.00296	.00369	.00147

Manufacturer C

Load	Fluidity Fresh	2 Days	5 Days
1000	.00394	.00400	.00321
1000	.00625	.00658	.00513
800	.00576	.00618	.00413
600	.00518	.00548	.00267
400	.00431	.00448	.00289

Manufacturer D

Load	Fluidity Fresh	2 Days	5 Days
1000 (1st)	.00245	.00370	.00476
1000	.00444	.00517	.00820
800	.00396	.00579	.00651
600	.00333	.00514	.00562
400	.00250	.00397	.00440

Manufacturer E

Load	Fluidity Fresh	2 Days	5 Days
1000 (1st)	.00386	.00431	.00382
1000	.00500	.00562	.00807
800	.00440	.00504	.00667
600	.00372	.00421	.00508
400	.00259	.00301	.00333

The changes in printing pastes due to bacterial action are well known, as all starches and natural gums thin down very quickly when fermentation begins. The ensuing table shows the effect of fermentation on a starch-gum paste which was inoculated with a small amount of sour paste and kept at 37° C. for several days.

Effect of Fermentation on Fluidity

Load	Fluidity @ 23½° C. Fresh	24 Hours	48 Hours
1000	0.00216	0.00256	0.00413
800	0.00170	0.00204	0.00343
600	0.00114	0.00143	0.00280
400	0.00053	0.00070	0.00162

Even though the paste had thinned very noticeably in 48 hours, it had not yet soured enough to give an acid reaction or develop any appreciable odor.

The obvious way to overcome this fermentation difficulty is to add a preservative to the paste. Although there are quite a number of chemicals which may be added to the paste, care should be exercised in choosing one that will not interfere with the printing process. For example, formaldehyde should never be added to Rapidogen pastes, since the formaldehyde destroys the color of the Rapidogen Yellow. Phenol can be used for this purpose, but much better results will be obtained using substituted or chlorinated compounds of this type. The sodium salts of these compounds are water soluble; but in this case it is wise to add the preservative before cooking, so that if the paste is acidified, the preservative will be evenly distributed throughout.

Fermentation is one of the chief causes of foaming, and this will be taken care of if the paste is properly preserved. However, several other factors cause foaming, particularly gassing caused by the decomposition of salt colors. Quite a number of anti-foaming agents such as turpentine, kerosene, octyl alcohol and pine oil may be used, with fairly satisfactory results; but until the exact cause of the foaming is known, it is not possible to prescribe a cure for it.

Decomposition of chemicals in the paste is comparatively rare. The sulfoxylates used in vat color printing are generally stable, so little trouble should be encountered. The only dyestuffs which are likely to cause any trouble by decomposing, will be the salt colors, which can only be partially stabilized by proper choice of thickener, and by keeping the printing color as cold as possible.

From the above remarks it will be seen that at least some of the difficulties in the color shop and print room can be overcome by considering the factors causing changes in the pastes, although there are still some items which need further study, before satisfactory solutions can be offered.

ONE HUNDRED AND TWENTY-SECOND COUNCIL MEETING

THE Council held its 122nd meeting at the Penn Athletic Club in Philadelphia, on Friday morning, April 21, 1939. Present were President Alban Eavenson, presiding; Arthur R. Thompson Jr., Vice President; William R. Moorhouse, Treasurer; Louis A. Olney, Chairman of the Research Committee; William H. Cady, Elvin H. Killheffer, Robert E. Rose, and P. J. Wood, Past Presidents; Perrin N. Collier representing the Southeastern Section, Henry F. Herrmann representing New York, Walter M. Scott representing Northern New England, Charles A. Seibert and Herbert S. Travis, representing Philadelphia, and Ben Verity representing Rhode Island; William D. Appel and Robert W. Philip; and Harold C. Chapin, Secretary. The Secretary's report of the 121st Council meeting and balance sheet of April 18, and the Treasurer's report of April 20, were accepted.

A report was accepted on the letter ballot of the Council for the By-Laws as amended in the 121st Council meeting, and in accordance therewith the By-Laws were declared adopted. W. R. Moorhouse and H. C. Chapin were authorized to arrange for bonding of Treasurer and Secretary as provided therein. Through members of the Southeastern Section present, thanks were extended to that Section for its hospitality at the Atlanta meeting. Plans for the next General Meeting, on September 15 and 16 in Boston, were discussed. A report of progress toward organization of a Southwestern Section was received from Mr. D. S. Culberson. A further report was received from the larger committee appointed in the 121st meeting to

SECRETARY'S BALANCE SHEET, APRIL 18, 1939

	Applications	*Dues Regular and Reinstate.*	*Dues Corporate and Sustain.*	*Miscellaneous*	*Bank Charges*	*Totals*
Received by Secretary, Nov. 1, 1938 to Feb. 4, 1939	$502.50	$9,041.00	$2,295.00	$1,204.16	—$2.92	$13,039.74
Received by Secretary, Feb. 4 to Apr. 18, 1939	245.00	822.36	60.00	139.99*	— 1.25	1,266.10
Total received	747.50	9,863.36	2,355.00	1,344.15	— 4.17	14,305.84
Transmitted to Treasurer	657.50	9,602.61	2,345.00	1,294.50		13,899.61
Leaving to order of Secretary	90.00	260.75	10.00	49.65	— 4.17	406.23

*Miscellaneous			
Year Books	$37.30	Crock-Meter cloth	11.00
Reporters	19.45	Dyed standards	16.50
Buttons	7.50	Analytical Methods	.75
Crock-Meter profits	47.49	Total	$139.99

continue the work of the Committee on Coordination of Standards, and this committee was authorized to employ personnel to carry on the work recommended. The next meeting of the Council was called for Friday, June 16, at 9:30 A.M. in New York.

The Atlantic Mills of A. D. Juilliard & Co., Inc., were elected to Corporate membership. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

Senior

D. W. Adams	W. E. Gleadall	P. L. Meunier
M. D. Bartholomew	A. Herdin	E. A. Oberer
L. H. Bingham	G. E. Hopkinson	F. P. O'Brien
S. D. Bock	L. A. Johnson	W. J. O'Connell
J. L. Campanella	M. Katzman	A. J. Olson
J. E. Cummings	T. J. King	J. H. Pickles
C. L. Daley	G. Krit	L. W. Schoelpple
W. A. Douglass	O. T. Lankford	J. A. White
H. L. Dunlap	F. S. Lathers	R. R. Willgoos
	J. L. Meltzer	G. A. Wolfe
	J. L. Mercer	

Junior

J. N. Bennett	H. M. Hunter, Jr.	W. H. Perry
W. J. Cramer, Jr.	W. H. Montgomery.	E. D. Robinson
C. F. Hagelstein	A. H. Noble, Jr.	L. Scolavino
W. F. Halstead		G. E. Stubbs

Associate

K. F. Ebert	R. B. Lueg	J. H. McCall
F. H. Knowlton		A. L. Van Wart

Student

D. S. Braiden G. D. McTeague H. Taylor

J. Labarthe, Jr., W. C. Magill, G. F. McDonald, C. M. Moor, and W. W. Trowell were transferred from other classifications to Senior membership.

Respectfully submitted,

H. C. CHAPIN, *Secretary.*

ONE HUNDRED AND FIFTEENTH MEETING OF THE RESEARCH COMMITTEE

THE 115th meeting of the Research Committee followed the Council meeting in Philadelphia on Friday afternoon, April 21, 1939. Present were Chairman Louis A. Olney presiding, W. D. Appel, K. H. Barnard, J. R. Bonnar, W. H. Cady, H. D. Clayton, P. N. Collier, Alban Eav ison, A. H. Gaede, H. F. Herrmann, E. H. Killheffer, W. R. Moorhouse, G. A. Moran, D. H. Powers, R. E. Rose, W. M. Scott, C. A. Seibert, A. R. Thompson, Jr., H. S. Travis, Ben Verity, W. S. Williams, P. J. Wood, and H. C. Chapin.

The Chairman reported on a recent meeting of the American Standards Association, of which our Association recently became an Associate Member. Mr. Moran presented a written report on "Fastness Tests for Dyed or Printed Cotton," approved by his committee and a committee of the National Association of Finishers of Textile Fabrics. Subject to minor revisions this was approved by the Research Committee, and on motions of Mr. Herrmann and Mr. Appel, it was voted that it be offered for acceptance by the American Standards Association, the American Society for Testing Materials, the Federal Specifications Executive Committee of the Procurement Division, Treasury Department, and the Trade Standards Division of the National Bureau of Standards.

Mr. Barnard described progress of work on crease resistance and permanence of finish under Professor Schwarz at the Massachusetts Institute of Technology, and Dr. Scott summarized a report by Professor Schwarz on bibliography of tests for permeability of fabrics by water. Mr. Clayton reported that his committee had started work on shrinkage of wool, silk and rayon, and would be able to make a statement of progress at the next meeting. Mr. Bonnar reported briefly for the new Committee on Color Transfer. The matter of abrasion tests was again brought up, and while development of tests was deemed outside the province of the Association, it was decided proper to publish in the Year Book references to the tests of other associations.

Tests for discoloration of chlorine bleached cotton in storage and under heat were discussed; also temperatures,

and construction of jars and balls, for the launderometer. It was voted that group C test for fastness to fulling on page 145 of the Year Book of 1938 be abandoned, as superseded by other tests in the book. On Mr. Cady's suggestion it was decided that tables for identification on fibers be published in the next book. Dr. Scott stated that a limited number of the periodical reports of the Inter-Society Color Council were available for mailing for members particularly interested.

Respectfully submitted,

H. C. CHAPIN, *Secretary.*

MEETING, RHODE ISLAND SECTION

THE March meeting of the Rhode Island Section was held at the Providence Engineering Society rooms, 195 Angell St., Providence, on March 31st, at 8 P. M.

The meeting was opened by Chairman Richard Haworth who announced that the April meeting would be the final one for the season. The chairman then appointed the following Nominating Committee to present at the next meeting nominations for Chairman, Vice-Chairman, Treasurer, and Secretary for the coming year:

Walter Simms
Carl Adams
Dave Truax

A sound movie, entitled "Eight Billion Yards" and made by the Pepperell Manufacturing Company, was then presented.

The first speaker of the evening was Mr. James Buchanan of the Seekonk Lace Company who gave the following interesting facts about the lace industry:

"Prior to 1818 all laces made in America were made by hand. In 1818 parts of a small lace machine were smuggled into the United States and a small plant was opened in New York in 1819, which was in operation until 1830. During that time plants were opened in Boston and Connecticut. In 1830, Great Britain, feeling that the lace industry might be lost, got in touch with some our pro-British members of Congress and had the tariff reduced.

"From 1820 to 1830 some progress was made, but for 70 years after 1830 little effort was made to revive the industry because Great Britain shipped in products for less than American manufacturers could compete with.

"In 1909 there were seventeen plants throughout the country, and members of Congress, realizing there was a possible future for the American lace industry, put a higher tariff on laces and reduced the duty on lace machines. In 1909 the industry began to grow, and in 1913 the tariff was reduced again, but from 1914 to 1919 very little was shipped in from foreign countries due to war conditions.

"There are now 657 lace plants in America, and Rhode Island is the largest lace producing state in the Union.

"In 1820 the lace machine was only 8″ wide and made eight 1″ bands of lace. Today the machines are 220″ and 260″ wide.

"Goods from a lace machine are six yards wide and thirty-six yards long. They are dyed in a kettle with an overhead reel, very slowly to avoid uneven dyeing. After dyeing, the goods are extracted or run through a squeeze roll, and then sized. They are then placed on a tenter frame, not movable, thirty-six yards long and six yards wide, and hot air is circulated through the material. It takes about eighteen minutes to dry. It is then cut into thirty-six inch strips, folded on cards, and sent to the trade.

"In making the narrower lace, ½″ to 6″ wide, a thread is run through at the proper places, and after finishing this draw thread is pulled out and the bands separated, leaving a finished edge on both sides."

The second speaker, Professor E. R. Schwarz of the Massachusetts Institute of Technology, spoke on the methods and reasons for measuring the different factors in fabrics and explained that the Association, feeling there should be better measurements of finishing fabrics in order intelligently to apply or determine what has been done, has worked out an agreement with the Massachusetts Institute of Technology to carry through a program of thorough examination of existing equipment together with designs of new equipment.

Professor Schwarz pointed out that most of the difficulty is in the fact that we do not know what we are measuring. The M. I. T. has tried to develop a scheme of equipment to test flexibility and softness of fabrics, etc.

"Using bending length as an illustration, form a pear-shaped loop of cloth on a ball and take the measurement from the bottom of the ball to the bend in the fabric, and this figure will give the bending length of the fabric.

"There are those fabrics which bend about a horizontal axis and those about a vertical one, so the tests must be split into these two bendings.

"Some fabrics must have a resistance to flexibility so in addition to bending length we want a factor which represents this. As force is necessary to push on a fabric to make it bend, we suggest dividing the bending not only into bending about a horizontal or vertical axis, but, also into a measurement of deformation. A fabric may take a lot of pressure to push it out of its own position, but may bend of its own accord. Thickness also must be taken into account, as it may be more resistant to bending but softer to feel. The flexibility of cloth in one direction affects the flexibility of the other direction."

Professor Schwarz demonstrated an inexpensive instrument which they were using in the laboratory, for measuring flexibility.

Respectfully submitted,

LOUIS D. FLEMING, *Secretary.*

MEETINGS, NORTHERN NEW ENGLAND SECTION

A MEETING of the Northern New England Section was held at the Hotel Manger in Boston on Friday, March 10, 1939.

There were one hundred and thirty-two members present at the dinner, and about one hundred and fifty members were on hand for the technical program, which followed a short business session. The technical program consisted of a paper, "The Application of Dry-Cleaning to Mill Processing" by Mr. Roland E. Derby, Chemist, of the M. T. Stevens & Sons Company.

Mr. Derby presented a most interesting paper on the installation which he has developed at the M. T. Stevens & Sons Company for the dry-cleaning of fabrics from the loom by a continuous process. The process aroused considerable interest among those present and was responsible for our very large attendance. Mr. Derby's paper and discussion will be published in a later issue of this magazine.

Another meeting of the Northern New England Section was held at the Manger Hotel in Boston, on Friday, April 7, 1939.

There were forty-nine members present at the dinner, and, about sixty members were on hand for the business and technical meeting which followed.

At the business meeting, Chairman Nutting appointed the following:

Nominating Committee: Mr. K. H. Barnard, Mr. R. E. Derby, Mr. E. B. Bell.

Auditor: Mr. H. Sheehan.

Chairman of 1939 *Outing*: Mr. H. Selya.

The technical part of the program consisted of, "A Discussion of the Metachrome Method of Dyeing" presented by Mr. C. H. Schmitt, of the Sandoz Color & Chemical Company. This paper was very interesting and aroused considerable discussion among the members present.

Respectfully submitted,

JOHN N. DALTON, *Secretary*.

MEETING, NEW YORK SECTION

THE regular meeting of the New York Section was held at the Chemists' Club, 52 East 41st Street, New York City, on April 21st, 1939.

Mr. Roland E. Derby, Chief Chemist, M. T. Stevens & Sons Co., spoke on "The Application of Dry Cleaning to Mill Processes."

Mr. Henry F. Herrmann, Chairman of the Special Nominating Committee for Selecting Two New Councilors, offered the names of Dr. Harold W. Stiegler and Mr. George L. Baxter for this Section for the balance of this term. A motion was proposed and seconded unanimously that the Secretary cast one ballot electing these gentlemen to office.

The Nominating Committee for the coming year's selection of officers for the New York Section is as follows:

Dr. Joseph F. X. Harold, Chairman
Mr. Ephraim Freedman
Mr. George L. Baxter

Mr. H. R. Tisdale, Chairman of our Program Committee, referred to the next meeting which is to be held at the Swiss Chalet on May 19th, at which time Dr. Jerome Alexander will present a paper.

It was indicated that definite plans for the Annual Outing of the New York Section, which is to be held at the North Jersey Country Club on June 16th, are now under way.

Total attendance: Ninety-five (95).

Respectfully submitted,

P. J. KENNEDY, *Secretary*.

MEETING, PHILADELPHIA SECTION

THE last meeting of the Philadelphia Section was held at the Penn Athletic Club on Friday evening, April 21, 1939. We had as our speaker Mr. Lucien Buck of Proctor & Schwartz Company, and his subject was—"The Principles of Drying and Textile Dryers."

Through the courtesy of the Standard Oil Company of Pennsylvania a very interesting film, "Safari on Wheels," was shown by Mr. H. C. Roemer.

Also at this meeting we had as our guests, the officers of the National Association as well as various Councilors from other Sections, who held their Council meeting in Philadelphia on the same date.

The attendance was 81.

Respectfully submitted,

J. P. CONAWAY, *Secretary*.

LAPEL BUTTONS

A supply of lapel buttons in 10 Kt. gold, bearing the seal of the Association, is available. Orders from members in good standing, accompanied by price of $1.50, may be addressed to the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. Please make checks payable to "Secretary, A.A.T.C.C."

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary or the American Dyestuff Reporter any vacancies which may occur in their businesses.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

NOTE: PERSONS WHO HAVE OBTAINED EMPLOYMENT SHOULD NOTIFY THE SECRETARY OR THE AMERICAN DYESTUFF REPORTER AT ONCE.

IMPORTANT NOTICE
To Prospective Employers

Complete personal histories and employment records of the following applicants are now on file at the office of the American Dyestuff Reporter and with the secretary of the Association. These may be examined by prospective employers or copies will be loaned upon application.

A-B-7

Education—Evening school in textile dyeing and chemistry.

Experience—Dyehouse laboratory for 2 years. Foreman dyer and finisher on hosiery for 9 years. Experience on ribbons also vat dyes on rayon and silk skeins. 2 years assistant to superintendent. Desires position either in demonstrating and sales or dyer; New York Viciniy. Age 33; married.

A-B-8

Education—Graduate Chemist.

Experience—Print superintendent, colorist; eleven years' experience in all types of fabrics, specializing on rayon; 8 years' dyestuff laboratory and demonstrating. Excellent references; age 36; married.

A-B-C-4

Education—Educated abroad.

Experience—Twenty years experience in the textile field as bleacher, dyer, finisher and chemist. 16 years in charge of dyestuff laboratory of large dyeing plant, 4 years as chief chemist with large bleachery. Has tested dyestuffs, and chemicals used in the textile field and has manufactured soaps and textile specialties. Has handled all textile fibers; bleaching, printing, dyeing and finishing same. Has done pigment and lacquer printing, waterproofing and fireproofing. Reason for leaving last position was due to business conditions.

Age 41; married.

A-B-C-6

Education—English Municipal School of Technology; Board of Education, So. Kensington Chemistry Certificates; City & Guilds of London Institute in Bleaching and Dyeing.

Experience—In U. S. A. 22 years as chemist and chief chemist with one of the largest textile plants in the country; expert colorist; long experience with permanent and semi-permanent finishes. Specialist on vats, naphthols and indigosols. Age 50; married.

A-B-C-D-1

Education—Lowell Textile Institute, Bachelor of Textile Chemistry; Lowell Textile Institute (Evenings), 2 years D. C. Electricity; 2 years A. C. Electricity.

Experience—Six years as chemist and assistant dyer with a large organization. Specialized in dyeing, finishing, bleaching and drying of woolens, worsteds, cottons, rayons and unions in the piece. Some sales experience. Desires position as chemist, dyer, finisher, bleacher or sales. Age 30; American citizen; Married.

A-B-C-F-1

Education—Textile institute course; extension work at Brown; executive training with Alexander Hamilton Institute; knowledge of German.

Experience—Dyeing executive in all types of textiles, including stock, yarns, and piece-goods. Thorough knowledge of all classes of dyes and dyestuffs, and their successful practical application in the plant. Wide experience in all types and makes of equipment used in dyeing, bleaching, mercerizing and finishing. Laboratory practice in planning and checking methods and processes, costing and purchasing. Good manager personnel for efficiency and satisfactory results economically obtained. Cotton, rayon and silk, some acetate rayon, and mixed fabrics. Excellent references; in excellent health.

A-B-C-F-2

Education—Lowell Textile Institute, 1911.

Experience—26 years in cotton yarn and piece goods finishing plants; expert on naphthols, vats and other cotton and rayon dyeing; all types of control work and testing; analytical processes; purchasing of dyes and chemicals. Age 46; excellent references; in perfect health; will go anywhere; married.

B-4

Experience—Foreman dyer in charge of ribbon dyeing for 20 years. Experienced on silk, cotton, rayon, acetate yarn. Age 41; will go anywhere.

B-5

Education—High School and Textile School Graduate.

Experience—Twelve years overseer of dyeing on directs, vats, naphthols, sulfur, basic and developed colors. Also experienced bleacher. Age 40; married; references.

B-6

Education—Textile School Graduate.

Experience—Former instructor in chemistry and dyeing. Twelve years' experience as overseer of dyeing of vats, naphthols, developed, indigosols, sulfur and direct colors on piece goods. Age 35; excellent references.

B-C-3

Education—Graduate, Philadelphia Textile School; speaks German fluently.

Experience—Employed at velvet company for 7½ years. Past 2 years working in finishing department on regular, waterproof and crush-resistant finishes (resin finishes). Can take charge of finishing of velvets. Have some piece dyeing experience.

29 years of age; married; will go anywhere.

F-1

Education—Two years high school; 6 years evening engineering school; 1 year evening textile school; 1 year industrial management; course in accounting.

Experience—Ten years in an executive capacity in full fashioned hosiery manufacturing business. Familiar with entire manufacturing procedure, finishing dept., dyehouse and office. Specialized in finishing dept. and has good eye for color, finish and quality. Had responsibility of all orders going through mill, stock, grey goods and traffic. Five months in New York sales office. Gets along well with people and contact with employees and customers has always been satisfactory. Previous to hosiery experience was in a mechanical business for 17 years.

43 years of age; single, in good health; will go anywhere.

Present Uses of Logwood

(Continued from page 260)

There are four distinct methods for dyeing wool at present. Each has its reason for use but all have one common characteristic, a black shade, deep in intensity and bloom, and fast to washing, fulling, light, potting, cross-dyeing and milling.

Outside of the "saddened blacks" of a hundred years ago, the oldest and cheapest formula is that using a plain mordant bath of bichromate of potash or soda. The so-called "sweet chrome mordant": The raw stock wool, carbonized stock, or waste is simply boiled up for an hour with 2-3% of bichromate of soda and then washed to free the stock from chrome. Then boiled easily for 1-2 hours in a bath containing 6-10% of hematine crystals.

I know the owner of one dyehouse who, at the present time, boils his wool stock with 2% bichrome for 2 hours, rinses and dyes out with 6% hematine crystals, boiling in dyebath for 2 hours. He then pulls the plug and lets smother overnight and washes up the next morning. That is the cheapest fast black I know of.

The "sweet chrome" mordant bath is considered by some to have a harsh action on the wool fiber. I do not think this harsh feel would be noticed on shoddy stock or re-worked wool, however. Also, there are probably tricks in the trade which enable the experienced operative to dye by this method and still obtain a soft handle; probably by keeping the bath just under the boil and using a good softening oil in the dye bath. This method of dyeing logwood black is still used by many dyers in Scotland and England.

The most common mordant used is that of chrome and sulfuric acid. This is practically the same as the sweet chrome mordant method and almost as cheap. The chrome-sulfuric mordant, however, has a beneficial scouring action which removes all loose color in the stock and mordants the wool at the same time. The time in the mordanting bath, the rinsing and the dyeing are carried out as with the sweet chrome mordant method. From 2-3% of chrome and 1% of sulfuric acid is used.

Opinions may differ as to the harshening effect of the above mentioned processes, but every dyer seems to agree that the mordant using chrome and tartar produces a very soft handle and feel to the stock. The first two methods produce chromic acid, a strong oxidizing agent. The chrome-tartar mordant produces a basic chrome oxide on the fiber. Chromic acid on wool has a characteristic orange-yellow color which changes, however, on boiling or standing, to a green chrome oxide. The chrome-tartar mordant produces the green chrome oxide which has an affinity for the hematine.

The chrome-tartar mordant is more expensive to use than the former method, and naturally is used on better grades of wool and also piece goods. The time of mordanting and the dyeing is the same as the before mentioned methods. Generally 3% of chrome and 3% of tartar are used. Since the wool is rinsed after the mordanting, all loose color and dirt are removed before dyeing.

The many restrictions placed on the dyehouse to conserve time has compelled the dyer to use methods which will give him greater production and he has had to look for a method to shorten the time of dyeing. The older one-bath method for a logwood black, using copperas-bluestone-oxalic acid and logwood, required very careful manipulation for satisfactory results. The lake formed by the logwood with the copperas and bluestone was kept in solution by the oxalic acid. If not enough oxalic acid was used, the shade rubbed badly. If too much oxalic was used, the black did not develop.

Fortunately, the chemistry of the mordanting process with chrome was thoroughly investigated. It was found that wool could be mordanted with chrome and if the correct combination of reducing acids was used, all of the chrome could be exhausted and reduced on and in the wool fiber and, consequently, there could be no objection to the addition of the hematine directly to the mordant bath after this was accomplished, since there was no chrome present to form a free lake with the hematine in the solution.

That is the principle of the present successful one-bath logwood black on wool. As to the actual time necessary, that depends on the results wanted. I have known of a dyer who dyed a top chrome black in 1½ hours, but admitted he was pushed for time to meet a price situation and did not claim to be doing a first class job. I have known other dyers to take four hours to dye a top chrome black and they were doing a first class job.

A dyer should figure from three to four hours for a first class one-bath logwood black. From 1½% to 2% chrome is used together with 6-8% of prepared acid or equivalent amounts of lactic, tartaric or formic acid.

The highly oxidized logwood should not be added to the mordant bath until the chrome has entirely been taken up by the wool. It is easy to determine this as the mordant bath will be clear as water when the chrome is properly fixed and the wool will have the characteristic pale green color.

You will note I have not mentioned the use of bluestone in the above mordant bath. I leave it to the judgment of the dyer. The bluestone has certain properties—some desirable—others not so good. Bluestone acts as a catalytic agent to speed up the oxidation of the logwood, and thereby gives a darker shade of black. It acts as an additional mordant for the shrives, burrs and other vege-

table matter present, and increases the fastness to light. But, it increases the amount of metallic mordant and tends to form a free lake with the logwood and thus increases the rubbing factor.

Naturally, the logwood black colors the vegetable matter anyway, and thus saves the considerable expense of speck-dyeing or carbonizing; this item should be credited in favor of the cost of dyeing the logwood black.

Logwood black also increases the weight of the dyed wool. This fact is taken into account by the wool dyer. He often uses it on some of his top-chrome dyed blue or black piece goods which come out light in weight. The topping with logwood (hematine crystals should be used) blooms up the shade and restores the weight desired.

SILK

As the real silk industry has suffered on account of the competition of the synthetic fibers, so has the volume of logwood business used on silk. Logwood is still used on real silk, however, when fast black shades are called for. Both piece goods and yarn are dyed with logwood and the shade of black obtained is standard for many other lines.

The simplest formula for real silk is to treat the boiled-off silk in a bath of red iron. This is a basic sulfate of iron, standing at from 10° Bé. to 20° Bé. for one hour cold. After washing, the silk is dyed with hematine, fustic and soap.

LEATHER

The tanning and dyeing of leather is a much more complicated process than the dyeing of wool or silk. Here, too, however, the natural dyewoods play their indispensable part in the finished product. The tanning of skins has to do with the process whereby hides are converted into leather. To be accepted by the general public however the tanned hides must be colored. The natural dyes are generally used at the start of the dyeing operation. They act to give the ground color and also exert a slight retanning action and facilitate the subsequent dyeing and penetration of the aniline dyes used for shading purposes. The resulting costs are less than would be the case had aniline dyes been used alone to produce the shade. While logwood is the chief natural dye used on leather, many other natural dyes are used to produce shades on leather. Examples are fustic, hypernic or Brazilwood, quercitron bark extract, osage orange, gambier and sumac.

Leather is sensitive to heat, and generally the dyeing baths are not treated much above 120-140° F. Combinations of the above mentioned natural dyes are first applied in the drum, and the color set with small amounts of chrome, copperas or bluestone as a striker. Acid colors may be used in the same bath as the natural dyes but basic colors are applied in a separate bath to prevent precipitation.

COTTON

Logwood, fustic, bark extract and cutch are the chief natural dyes used on cotton at the present time.

Cutch is used for the cutch brown which is very fast to light and washing on cotton goods. Cutch also prevents the formation of mildew.

The largest amount of logwood is used to dye cotton piece goods since this class of merchandise lends itself to a continuous process of dyeing. A smaller amount of logwood is used in raw cotton to produce a light blue color by the old soda ash and bluestone formula.

The logwood black on cotton piece goods is the cheapest fast black that can be produced, but to gain economy it is necessary that the piece goods be run continuously. The basis of the first bath is about a 10% logwood solution. Other additions may be made to the logwood bath to vary the resulting shade but the main ingredient is the logwood. Bark extract and chestnut extract are sometimes used. After passing through the logwood bath the cloth may be treated in two different ways. The first and the cheapest way is to pass it through a weak pyrolignite of iron solution and then, after allowing to oxidize, to wash up and finish. The second way is to dry after coming from the logwood bath and then pass through a strong hot chrome bath to produce a black lake. After the chrome bath the cloth goes to a steamer or ager, and then is washed well, and then to a starch mangle. The speed of the machine may vary widely depending on the thickness or weight of the cotton cloth. The lighter the material the faster it may run.

PRINTING

A very fast black is printed on cotton cloth by use of so-called steam black. This is a logwood product containing oxidizing chemicals which are acted on by a steamer to precipitate the black lake. The steam black made by logwood is cheaper than the aniline black and is not liable to the tendering action of the aniline black. The aniline black, however, will stand chemiking with chlorine which is not true of the logwood steam black.

FURS

The dyeing of furs requires a great amount of experience, and the experience is not easy to acquire. The leather of furs is even more sensitive than the ordinary leather used for shoes and bags. The process takes many weeks, as high temperature can not be used to speed up the coloring process. Such luxury furs as seal (Alaska), Hudson seal (dyed muskrat), chinchilla, skunk and Persian lamb are all processed with logwood for black.

The natural dyes are eminently suited for the coloring of furs which come into contact with the human skin as they are non-poisonous.

To give some idea of the number of processes necessary to produce a satisfactory color on a skin, we give the following general formula:

There are three distinct operations, namely—killing, mordanting and dyeing.

Generally speaking, use for each skin (caracul, Persian lamb, broadtails, etc., 18 in. by 12 in. approx.) at least 1 gal. of water or liquor, sufficient to float the skin.

Killing: is sometimes referred to as washing or mordanting, but in reality it is cold scouring to remove the oils or greases so that the hair (wool) is in a receptive condition to be mordanted.

A general formula for small skins is as follows: 4 oz. sal soda to the gallon of water at normal temperature, about four hours, for short or easily killed hair. For hard to kill, with coarse guard hair, kill first by brush method, then the dip method as above. Wash thoroughly, acidify, then mordant.

Some kills that are used are as follows: sal soda, soda ash, carbonate potash, ammonium carbonate, slaked lime, ammonia, caustic soda, ammonium chloride. Free alkali salts (caustic soda) should be used with great care, using small quantities and taking longer time to obtain results. A combination of the above alkaline salts are often used.

Mordanting: sometimes called dyeing. Some examples are as follows:

No. 1	No. 2
1 gal. water	1 gal. water
3/4 oz. copper sulfate	3/5 oz. iron sulfate
1/3 oz. acetic acid.	1/3 oz. acetic acid
4 oz. salt (common)	

No. 3	No. 4
1 gal. water	1 gal. water
1/2 oz. iron sulfate	1/4 oz. bichromate potash
1/2 oz. copper sulfate	1/8 oz. cream tartar
1/2 oz. acetic acid	1 gram copper sulfate

It requires at least four hours to mordant skins and preferably over-night. Temperature about 85° F. Not over 90° F. Wash thoroughly and dye.

Some mordants used for this purpose are as follows: iron sulfate, iron acetate, copper acetate, copper sulfate, alum, bichromate of soda or potash, etc. They are used in combination usually with an organic acid.

Dyeing: sometimes called topping or coloring. Blues or blacks.

1 gal. water
2 oz. logwood crystals

at 85° F. for four hours. Lift and add to bath: 1 oz. black iron liquor for each gallon of liquor. Lay overnight. In the morning lift and drain (called bridging; two or three sticks across the tank like a bridge to allow skins to drain), then at end of day, heat bath to 85° F. and re-enter skins. Lay overnight. Repeat this until near right shade, then squeeze, not wash, hang to age or until almost dry, then sponge the back (leather) with 8° Bé. (11° Tw.) salt (common) solution. Drum with sawdust and finish.

For dyeing brown shades use hypernic, quercitron, fustic, gall nuts, logwood, sumac. To these, instead of adding black iron liquor, add, if preference is had, other metallic salts as follows: copper acetate, iron sulfate, copper sulfate and alum in about the same proportions as above, for example:

1 gal. water
18 grams gall nuts (roasted)
18 grams hypernic extract
4 grams copper acetate
4 grams alum
2 grams iron sulfate

It usually takes from six to eight days to make a good deep brown or black. Some dyers take longer. It depends on the color and nature of the skins.

HAIR AND FIBERS

The curled hair industry is very large in this country. The hair is taken from a variety of animals but chiefly that of the hog or pig and horse is used.

Some of the hair is scoured and bleached but most of it is dyed black with logwood, bluestone and soda ash. The hair is thrown into a large wooden tank and packed with slabs of logwood and soda ash and bluestone. The tank is filled with water and steam turned on. The steam pressure keeps the solution agitated and the bunch of hair is boiled for several hours, when the liquor is drawn off and the damp hair allowed to smother before washing off.

A variety of Russian hog bristles is used for artists' brushes. It is dyed black by mordanting with chrome and sulfuric acid, rinsing and then dyeing with logwood.

Fibers like tampico and sisal are also dyed with logwood and are used in upholstery to compete with curled hair. These fibers are coated with a wax-like substance which resists the action of mordants and dyes. In practical work, it generally requires several hours to secure good penetration.

WOOD

Wood in many sizes and shapes has to be colored. In coloring it black, several formulae are used. The simplest one used for dominoes and checkers and bottle tops is to boil the wood blocks in a 10% logwood solution for an hour and then place in a cold bath containing 2% copperas for one-half hour, and then drain and dry.

Wood for knife handles and piano keys is generally dyed in a vacuum apparatus because perfect penetration is necessary.

SYNTHETIC FIBERS

The science which led to the discovery of the artificial fibers has not outstripped the age old dyeing properties of logwood. Rayon of both the viscose type and of the acetate type can be dyed with logwood.

The viscose and acetate types may be dyed by first treating the fibers in a strong solution of logwood and then, after rinsing, developing in a strong solution of chrome. They may also be dyed by first treating the fibers with a hydrous iron oxide and then, after rinsing, dyeing out with a logwood solution.

The newest member of the synthetic fibers, called nylon, may be dyed with a formula similar to the wool formula, using chrome and sulfuric acid as a mordant and then rinsing and dyeing out with a strong logwood solution.

In mordanting, at least 1% of sulfuric acid has been found to be necessary, otherwise, a blue shade will be obtained rather than a black. Likewise in the dyebath a minimum amount of soap is used. An excess of soap in the logwood bath produces a blue rather than a black.

I think the reader will now have a good idea of the many uses of logwood in the present scheme of the industrial arts. There are still other uses but they are of minor importance. The main uses have been mentioned above.

Possibilities for Development of the

Textile Industry in Texas

HON. W. LEE O'DANIEL*
and D. S. CULBERSON**

Turning Basin and part of the 45-mile Ship Channel, Houston, Texas, adjacent to which are industries involving capital investment of more than $250,000,000 and employing thousands of workers.

WOOL AND MOHAIR

DESPITE the fact that Texas produces approximately 65,000,000 pounds of wool and 14,000,000 pounds of mohair yearly, there are neither scouring nor manufacturing plants in Texas or the southwest. Most of the wool and practically all of the mohair is produced in southwest Texas, the industry centering on the Edwards Plateau northwest of San Antonio.

The vital factor in evaluating a woolen and mohair industry for Texas hinges on the market situation. A complicating factor is that northern mills do not cater particularly to southwestern requirements in woolen fabrics. The shipment of Texas-New Mexico wools to Atlantic Seaboard and the subsequent re-shipment of woolen fabrics to this territory is manifestly economically unsound, now that the southwestern market looms so large in the national equation. It may safely be assumed that if and when scouring and weaving of wool is undertaken in the southwest this development will immediately be followed by the launching of industries in the clothing field.

The last Federal Census Bureau estimate credits the State of Texas with a population increase since 1930, of approximately 1,000,000. While other sections of America have hung on what might be termed a "dead center," Texas has flourished and the southwestern market has been a bright spot in an other wise none-too-inspiring market picture.

No manufacturer of woolen fabrics needs be informed that Texas is the largest wool-producing state in the nation. The principal wool growing breeds in use are American Merino and Rambouillet. The merit of these wools is generally understood in the industry. Practically all the Texas wool plus a large tonnage from New Mexico, moves to coastwise export through the Port of Houston.

The labor situation is very attractive and no major conflicts have come up in the manufacturing centers in some time. The southwest is not a "cheap" labor market. The fact that its purchasing power is large, is based on fair wage schedules. The fact is widely recognized that living costs are materially lower than in the present woolen textile areas due to exceedingly mild climatic conditions.

In the case of a textile plant employing a considerable number of women, it will unquestionably be true that an exceptionally intelligent type of female worker will be found available. The southwest, generally speaking, does not have any great number of the type of industries which use women.

In regard to water supply, if the "frosted" method is used the water essential to efficient operation of a mill would be greatly reduced. Based, however, on the assumption that a large volume would be required it may be stated that the cost of industrial water is generally figured at 5 cents per thousand gallons in the southwest. This implies the boring of an artesian well and its equipment; plus cost of pumping, with allowance for amortization of the water supply investment.

It is pleasing to note at this time that there is no sales tax, no business license tax, no personal income tax and no corporation income tax levied by the State of Texas.

COTTON MANUFACTURING*

Cotton has at once and the same time been the greatest benefactor and the greatest curse of the Texas economy. It has been a great benefactor because, as the world's greatest fiber, it has had a world-wide market. It has been a curse because of artificial conditions arising primarily through the heavy industrial tariff that has cut down barter value of the American cotton in the foreign markets, which set the price of this staple. While changing political and economic conditions have made the cotton growing industry the subject of many tentative panaceas, there has always been universal agreement on one proposition respecting cotton in Texas, namely, that Texas will greatly better its status by manufacturing more cotton in this state. Texas now has about 20 operating cotton mills, with

*Governor of Texas.
**Southwest Representative, American Aniline Products, Inc.

*Excerpts from "Possibilities for Industrial Development of Texas" by W. Lee O'Daniel.

approximately 250,000 spindles and 6,000 looms. In 1935 the value of products of Texas cotton mills was $8,511,548 of which $3,126,723 was value added by manufacture. There were 3,568 wage earners.

This constitutes a sizable nucleus of a cotton-goods industry. Nevertheless, it is capable of consuming only about 2 per cent of the normal Texas cotton crop.

It is only a simple mathematical procedure to determine from this that, if Texas consumed all of its cotton at its own cotton mills, it would have 1,000 mills of equal size in Texas today with 12,500,000 spindles, 300,000 looms and 175,000 employes. As a matter of fact, a full development of the cotton mill industry in Texas, with the finer as well as the coarser spinning and weaving operations and with the allied finishing, dyeing and other processing industries, would furnish employment for 300,000 people. This would mean that approximately three-quarters of a million people would make their living from the cotton milling industry.

The future of the cotton-growing industry in Texas is primarily a matter of development of the market. Careful cultivation of all of the available soil resources of Texas might bring Texas' annual production up to 10,000,000 bales. Such is not in prospect in the near future.

The greater likelihood is that the cotton farmer of the future will devote his attention to producing more lint of better staple on fewer acres. A series of more-cotton-on-fewer-acres contests about 10 years ago were won by farmers who produced from three to four bales of cotton to an acre of land that under ordinary processes of cultivation produced one-fourth to three-fourths of a bale to an acre.

Prospects for a material development of the cotton milling industry in Texas are good. The shift of the milling industry of the New England and Middle Atlantic states has been largely into the Carolinas and Georgia. Today there are sufficient spindles in America, it is said, to take care of the American consumers' needs, but continued advancement of science, shifting markets, trade routes and the tendency of industry to decentralize will bring a gradual expansion of the textile manufacturing industry in Texas.

Texas has all the advantages to encourage growth of the textile milling industry, in addition to the primary consideration that Texas' mills are in the midst of the world's greatest cotton growing region. Intelligent labor, highly adaptable to skilled operation, low living costs due to the mild, healthful climate, deep water ports opening the way to the world's markets and ample power available in large community and small through 19,000 miles of high voltage transmission lines give the cotton goods manufacturer every advantage that he can have in any part of the United States.

CELLULOSE TEXTILES

Regardless of the particular type of raw material used by manufacturers of cellulose, the southwest offers at least as much as can be obtained elsewhere and certainly a great deal more than average. Because Texas is the largest cotton producing state in the Union, it produces a vast tonnage of linters. The Texas production of cotton linters yearly amounts to approximately 330,000 running bales. The majority of this amount is concentrated in Houston.

There is a tremendous reserve of pulpwood which exists in the Eastern part of Texas. This pine timber belt is equal in area to the state of Indiana.

Based on a cost of $3.00 per ton for stumpage, cutting and hauling to railroad 54,000,000 cords are available.

Transportation facilities are very modern in the industrial cities of Texas, there being a minimum of 17 railroads servicing all principal points, the Houston ship channel, Inter-Coastal Canal for barge service to all points on the Gulf of Mexico and regular coast-wise and foreign sailing periodically.

Texas power industry has 19,000 miles of transmission lines serving 60,000 factories in 1,600 cities and villages. There are 139 power plants, capacity of 964,350 K.W. or 1,290,000 H.P. The coming of economical power transmission through the interconnected system has been revolutionary throughout the industrial world, and it will be a significant factor in textile manufacturing development of Texas.

BOOK REVIEWS

Dyeing with Coal-Tar Dyestuffs. *C. M. Whittaker, B.Sc., and C. C. Wilcock. Third edition. 325 pages. D. Van Nostrand Company, 250 Fourth Avenue, New York. Price* $5.00.

Many who have made use of the earlier editions of Whittaker's "Dyeing with Coal-Tar Dyestuffs" will be pleased to learn that a third edition has just been published. Owing to the many activities of the original author, C. M. Whittaker, he has taken on C. C. Wilcock as an associate in the preparation of this new edition and together they have produced a very creditable volume. It retains all of the valuable features of the original text which has been thoroughly revised and brought up-to-date. The section relating to rayon dyeing has been considerably extended and now constitutes one of the best treatises on this subject that has been published. An entirely new chapter has been introduced entitled Auxiliary Products for Textiles. This constitutes a valuable addition to the book because these compounds have, during recent years, come to play an important role as accessories to the dyeing and finishing processes. This section might to advantage have been extended somewhat.

Regarding the introduction of chemical formulas, the authors appear to be somewhat inconsistent because at the beginning of the book on only two pages there are the structural formulas of six basic dyes, while with the exception of a structural formula for aniline and one for Naphthol AS, no others appear in the entire book. More generous use of formulas would undoubtedly have been of great assistance, particularly to students.

The following subjects are included:

Section I. General Survey of Dyeing—Historical—Old Methods—The Influence of the Discovery of Mauve—Gradual Development as New Classes of Dyestuffs Were Introduced—Fast and Loose Dyestuffs—The Present Trend of Dyeing—The Future Outlook.

Section II—The Basic Dyestuffs.

Section III—The Resorcine Dyestuffs.

Section IV—Acid Dyestuffs.

Section V—True Alizarine and Other Mordant Dyestuffs.

Section VI—Direct Cotton Dyestuffs.

Section VII—The Sulfur Dyestuffs.

Section VIII—The Azoic Dyestuffs.

Section IX—The Vat Dyestuffs.

Section X—Dyestuffs Produced on the Fiber by Oxidation of Coal-Tar Products.

Section XI—The Dyeing of Rayons.

Section XII—The Dyeing of Synthetic Fibers with an Affinity for Wool Dyestuffs.

Section XIII—The Dyeing of Union Materials, Including Garments.

Section XIV—The Evaluation and Identification of Dyestuffs.

Section XV—Auxiliary Products for Textile.

It is without question the best book published in English regarding the application of coal-tar dyes to textiles and can be highly recommended to all who are interested in the application of coal-tar dyes.

L. A. O.

Utilization of Fats. *A theoretical and Technical Treatise on Composition, Extraction, Analysis and Applications of Fats. By H. K. Dean, B. Sc., Ph.D., A.I.C. Foreword by T. P. Hilditch, D.Sc., F.I.C., Professor of Industrial Chemistry at the University of Liverpool.* 306 *pages,* 18 *illustrations,* 38 *tables. Chemical Publishing Company, New York City.* 1938. *Price* $6.00.

This book presents an excellent survey of the whole field of fats. Considerable space is devoted to the study of the constitution and properties of the fats and related compounds, also analytical methods. Many structural chemical formulas are introduced into the text. A section is devoted to the artificial fats, another to edible fats and the remainder of the book is devoted to relation of oils to manufacture of paints and varnishes, and miscellaneous uses of fatty compounds.

Dr. Hilditch, in his foreword says: "In my opinion this work will be found most useful because it is based consistently upon the fundamental chemical nature and properties of the various materials which have to be considered. This is still a comparatively new thing in books on this topic. The natural fats were regarded for so long by organic chemists as, apparently, too simple in form to be worthy of systematic study. Only within the last dozen years or so has the paradox of complexity arising out of simple organic acids and alcohols, familiarly dubbed "oil, fats and waxes," been treated seriously by a small section of these investigators; but it is generally conceded that we can now frame a much more adequate picture—although still far from a complete one—of the details of the chemical constitution of the many different types of natural glycerides. The author has made full use of this newer fundamental knowledge of the structure of fats, and also of their behavior, for example, to atmospheric oxygen, light and heat; and it is clear that in his discussion of the oxidation and polymerisation of oils he writes from the standpoint of the most recent investigations proceeding in that very difficult field."

Contents: CONSTITUENTS AND PROPERTIES OF FATS—Fatty Acids, Alcohols, Sterols, Hydrocarbons and Carotenoids, Chemical and Physical Properties of Fats and Fatty Acids—ANALYTICAL METHODS—General Methods, Special Methods, Determination of Fatty Acid Composition and Glyceride Structure, CLASSIFICATION, COMPOSITION AND ANALYSIS OF FATS—Structural Analysis of Fats, Fatty Acid Composition and Glyceride Structure, Composition of Artificial Fats—ARTIFICIAL FATS—Synthesis of Glycerides, Hydrogenation—EXTRACTION AND REFINING OF FATS—EDIBLE FATS—The Edible Fat Industries, Biochemistry, Rancidity—PAINT AND VARNISH OILS—Drying and Semi-Drying Oils, Vulcanized, Boiled, Blown and Stand Oils, Theory of Drying and Polymerisation—SOAPS AND FATTY ACIDS—Hydrolysis of Fats, Preparation of Fatty Acids, Saponification and Soaps, Physical Chemistry of Soap and Saponification—MISCELLANEOUS APPLICATIONS — Pharmaceutical Fats, Cosmetics, Lubricants, Leather, Sulphonated Oils, Wetting and Emulsifying Agents, Detergents.

Technologie Der Textilfasern VIII 3 B. Technologie Der Wolle Technology of Textile Fibers. *Edited by R. O. Herzog and F. Oberlies VIII 3 B. Technology of Wool. By H. Glafey, D. Krüger, and G. Ulrich. Julius Springer. Berlin,* 428 *pages.* 317 *illustrations.*

This latest volume in the series of books by Herzog and Oberlies is written more as a textbook than as a reference work. The field is covered thoroughly but in a somewhat elementary manner.

The book consists of four sections—Physics and Chemistry of Wool; Analytical Examination; Chemical Technology of Wool Manufacture, Mechanical Appliances for the Manufacture of Wool Textiles. The first three parts are complicated by much outdated data and some of the lately developed theories and data are rather lightly passed over. The fourth section (Machinery) is rather inadequate, consisting mostly of description of machines with very little on the function of the machinery.

For anyone reading German easily, the book may be recommended for review purposes and a general background. Its obvious function is the instruction of the student rather than use as a source of information for the technical man.

Deutscher Farberkalender fur das Jahr 1939. *Verlag Deutscher Färberkalender, Fanz Eder, München* 8. *Linen* 5 *marks, leather* 8 *marks (about twenty-five per cent higher in this country.)*

This latest edition of the German dyestuff handbook contains a number of very interesting articles in addition to the usual tables of constants and conversion tables. The contents include:

Development and Use of the Vat Dyes.

Contribution to the knowledge of acetate rayon manufacture.

Indanthrene dyes on crêpe.

New processes in wool manufacture.

Use of staple rayon in the carpet industry.

Level dyeing difficulties in wool-rayon blends.

Processing of reworked wool.

Developments in dry cleaning, laundering and garment dyeing.

Possibilities of the Immedial leuco dyes.

Casein fibers in finishing and dyeing.

New delustering process for rayon and staple rayon.

New materials in dyeing and manufacturing.

Drying of fabrics without stretching.

Dyeing of wool-rayon blends.

Bleaching of rayon and cotton-rayon blends.

These articles, while short, are rather comprehensive. They are written by individual authorities.

Chemical Industries. *Edited by D. M. Newitt, Ph. D., B. Sc. (Lond.), D.I.C., A.R.C.S., A.I.C., A. M.I. Chem. E.* 462 *pages. Published in* 1938. *American distributor-Chemical Publishing Company of N. Y. Inc.,* 148 *Lafayette Street, New York, N. Y. Price* $4.00.

This volume which is the twelfth edition bears a somewhat similar relationship to the British Chemical Industry as does the Chemical Engineering Catalog to the American Industry.

There are ten sections each conveniently marked with a marginal tab. Each section deals with some particular phase of plant construction or manufacture. They are as follows:

Section I. Materials of Construction Used in Chemical Industry.

Section II. Power Plant and Water Treatment.

Section III. Factory Equipment, Lay-Out and Location.

Section IV. Size Reduction, Mixing and Blending.

Section V. Separating and Grading.

Section VI. Handling, Conveying, and Transport of Materials.

Section VII. Instruments and Laboratory Apparatus.

Section VIII. Raw Materials and Heavy Chemicals.

Section IX. Fine Chemicals.

Section X. Mathematical and Conversion Tables.

In addition there is a very complete Index and eighty pages of Bibliography relating to the Chemical Industry.

British Chemical Industry. *Its Rise and Development by Sir Gilbrt T. Morgan and David Doig Pratt.* 387 *pages,* 57 *Half Tone Illustrations and* 79 *Line Drawing Figures and Tables. Published by Longmans, Green & Co., New York and Toronto. Price* $6.25. *Publication date June,* 1938.

The text of this book is based on a series of Public Lectures delivered at the University College of Wales, Aberystwyth, during the Session 1935-6.

The authors have endeavored to present a survey of the British Chemical Industry from its beginnings to the present stage of development, although the main portion of the text constitutes a discussion and description of the modern British Chemical Industries. Of the sixteen chapters, those referring to cellulose, dyestuffs and intermediates, plastics, industrial solvents, and fine chemicals will prove of considerable interest to textile and color chemists. The discussion of the vat dyes, indanthrenes and sulfur colors, is illustrated with numerous structural formulae of important dyestuffs of these groups. A section is also devoted to the modern dispersed dyes which have recently been developed for use with acetate rayon. The chapter on cellulose discusses and visualizes by graphic illustrations, the more recent views regarding the chemical constitution of cellulose.

The authors state that the trend towards economic self-sufficiency has become increasingly marked in recent years and is noticeable more or less among all industrialized nations. Even Great Britain, which was for so long the world's market for the free exchange of commodities, is not exempt from this tendency. Investigations are now on foot to diminish very appreciably the importation of sulfur minerals for sulfuric acid manufacture and of fermentable molasses for the production of industrial alcohol and its numerous derivatives. The problem of obtaining oil from coal is essentially an endeavor to replace a seaborne liquid fuel by an indigenous one. But even when these and other similar schemes of economic nationalism have materialized there will still remain arts and manufactures for which the basic raw materials can only be obtained from the Dominions, Colonies and foreign countries.

Throughout the book they have endeavored to explain in simple language the factors underlying the origin and development of their principal chemical industries which contribute to the national welfare in a manner that is not always fully appreciated.

Technology of Solvents. *Dr. Otto Jordan, translated from the German by Alan D. Whitehead.* 347 *pages. Price* $10.00. 1938. *Chemical Publishing Company,* 148 *Lafayette Street, New York, N. Y. Exclusive Agents in North and South America.*

The past ten years have seen many remarkable developments in the organic solvent industry. The rapid development in the use of lacquers for a multitude of purposes has been made possible and much safer both against excessive

heat and from toxic effects, largely through the introduction of new solvents. Much has also been accomplished in cost reduction.

In this translation the author has cooperated with the translator in bringing the book up-to-date, attention having been given to new products and publications which are of special importance to American and English readers.

The text of the book is classified under the following headings:

Definitions
Classifications and Analytical Control
Physical Properties of Solvents
Solvents for Cellulose Derivatives
Solvents for Resins, Rubber and Similar Binders
Use of Solvents for Extraction Purposes
Plasticisers
The System Plasticiser
The Physiological Action of Solvents
The Recovery of Solvents
Protective Measures
The Manufacture of Solvents
The Aliphatic Hydrocarbons
Turpentine Products
Cyclic Hydrocarbons
Chlorohydrocarbons
Alcohols, Ethers, Acetals
Ketones, Esters
Glycol Derivatives
Carbon Disulphide
Vegetable Oils as Plasticisers
Tables

This book will be found of value to both manufacturers and users of organic solvents and lacquers. It appears to go more into valuable and necessary details rather than devoting a lot of space to general matter of a less definite value.

TRADE NOTES • NEW PRODUCTS

OBITUARY

CARL PICKHARDT

CARL PICKHARDT, who was a prominent figure in the dyestuffs and chemical industry for more than fifty years in this country, died at his home in New York City on April 16th, after a short illness.

Mr. Pickhardt was born in Berghausen, the Rhineland, Germany, and came to the United States in 1867, later becoming an

American citizen. He was a partner in the firm of Wilhelm Pickhardt & Kuttroff, together with his brother, the late Wilhelm Pickhardt and the late Adolph Kuttroff. This firm later became Kutroff-Pickhardt & Co. They brought coal tar dyes to this country from Germany, and started and developed their manufacture here. Mr. Pickhardt retired from business when his firm became the General Dyestuff Corporation in 1926.

Mr. Pickhardt was extremely interested in outdoor sports and was a founder of the Camp Fire Club of America. He was one of the first members of the St. Andrews Golf Club at Hastings, New York, which was the first golf club in this country.

He is survived by Mrs. Pickhardt, three sons—William Paul Pickhardt, Dr. Otto C. Pickhardt, Commander Adolf V. S. Pickhardt, U.S.N.; four daughters—Mrs. William R. Nicholson, Mrs. Dorothy Kahle, Mrs. Jere Colman, Mrs. Gys P. Kuller; and eight grandchildren.

• NEW HATCH LOCATION

Hatch Textile Research, Inc., announces that its new address is now 25 East 26th St., between 5th and Madison Aves., New York City.

• TOUR OF INDUSTRIAL LABORATORIES

A tour of industrial research laboratories for members and guests of the Industrial Research Institute to climax in Washington with a two-day convocation at the National Academy of Sciences, was announced on April 10 by Maurice Holland, executive officer for the Institute, from the headquarters in the Engineering Societies Building, 29 West 39th Street, New York City.

The Institute, an affiliate of the National Research Council, will begin its visit to industrial laboratories on Tuesday, May 16, and will conclude the trip with a luncheon at the Hotel Mayflower in Washington on Saturday, May 20.

The group will assemble on Tuesday, May 16, at Canton, Ohio, where the first visit of the four-day trip will be at the laboratories of the Hoover Company. H. Earl Hoover, vice-president of the Hoover Company, is vice-chairman of the Institute. From Canton the party will proceed to Pittsburgh where they will make an all-day inspection of the laboratories and plant of the Jones & Laughlin Steel Corp. The host there will be H. W. Graham, chairman of the executive committee of the Institute, and chief metallurgist for the Jones & Laughlin Steel Corp. The value of research in the steel industry is being determined by practical results in the pilot plant research and development laboratories at the Jones & Laughlin Steel Corp., which the visitors will view.

On May 18 the party will visit the laboratories of the Hercules Powder Co., at Wilmington, Delaware, where O. A. Pickett, director of the Experiment Station, will personally direct the tour of inspection.

The party will reach Washington on Thursday night, May 18, remaining there on Friday and Saturday, May 19 and 20. The two-day Capital technical meeting of the Institute will be held at the National Academy of Sciences building where they will be welcomed by Dr. Albert L. Barrows, executive secretary of the National Research Council.

The Institute membership is made up of executives in charge of research laboratories for small and large industries in the United States. It was formed a year

ago "for co-operative study of the members common problems of research management, for mutual criticism, exchange of ideas in an effort to bring about constant improvement of laboratory management."

• HERCULES NEW YORK OFFICE

Hercules Powder Company's New York office will be located at 500 Fifth Avenue, effective about May 1, 1939. In making this announcement, W. M. Annette, in charge of the New York office, stated that Rex St. Clair will be manager of explosives sales. G. C. O'Brien will continue as manager of naval stores sales and as supervisor of general office activities.

• DU PONT RELEASES

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., announce release of the following new products:

"Ponsol" Olive GGL Paste—a new vat dyestuff for khaki and olive shades on uniform cloths and other types of service fabrics subject to severe wear. It produces a much bluer shade than "Ponsol" Olive G Double Paste and can be used alone or in combination. It is suitable for cotton and all forms of viscose rayon, the company says, and is recommended for the Franklin machine or the pigment-pad method. The dyestuff is said to possess very good resistance to hot pressing, light, laundering and washing, and good fastness to perspiration, according to the company.

"Luxol" Fast Blue MBS—a new spirit soluble color for making transparent lacquers and spirit printing ink colors. In alcohol solutions it may be used for coloring leather, paper, celluloid and wood. The dyestuff produces bright greenish shades of blue. It is equal in strength to "Luxol" Fast Blue AR and "Luxol" Fast Blue G, but much greener and brighter and possesses better fastness to light than either of these dyestuffs, the company says.

• WATER TREATMENT BOOKLET

A new booklet, "Water Treatment in the Textile Industry," discusses methods and equipment for the conditioning of water to meet textile plant requirements. Copies of the bulletin can be obtained free upon request from International Filter Co., 59 E. Van Buren St., Chicago, Ill.

"Water is the Textile Industry's most important raw material for processing," the bulletin points out. "It enters into every wet process stage of bleaching, dyeing, scouring, washing, etc., either as a solvent for carrying away impurities or as a vehicle for the chemicals used."

Thanks to the development of modern water treating methods and equipment, it is now possible to satisfactorily condition water from almost any natural supply. Water for use in a textile plant, the bulletin states, should be: (1) free from turbidity or suspended matter of any kind that might spot the fabric and prevent even dyeing, (2) colorless so that no color will be imparted to the fabric, and (3) soft in order to permit thorough and economical washing and to avoid spotting, uneven dyeing and other troubles.

Methods of treating water and the equipment required are discussed in the bulletin under the headings: Clarifying Water, Color Removal, Softening Water, Making Water Non-Corrosive, and Boiler Feed Water. Along with these discussions are illustrations showing water conditioning equipment—pressure and gravity filters, filter plant operating controls and gauges, softeners, chemical feeders, etc.

• TCCA MEETING

At the twenty-fourth annual business meeting of the Textile Color Card Association, held on April 20th at the offices of the organization, 200 Madison Avenue, all directors were re-elected for the coming year, as follows:

William Hand, E. Irving Hanson, Sr., Allan C. Jacobson, Carl E. Kempf, W. R. MacIntyre, Brainerd Pidgeon, Charles Pinnell, J. Laird Schober, Armand Schwab, Alfred L. Simon and Roy E. Tilles.

At a meeting of the directors held immediately after, the following officers were re-elected:

President: Charles Pinnell (Merrimack Mfg. Co.); 1st Vice Pres.: Roy E. Tilles (Gotham Silk Hosiery Co.); 2nd Vice Pres.: Armand Schwab (Armand Schwab & Co.); Treasurer: Carl E. Kempf (Brewster Hat Co.); Secretary and Managing Director: Margaret Hayden Rorke.

• COLOR PHOTOGRAPHY EXHIBIT

The Second Annual Exhibit of Color Photography, will open at the Fifty Rockefeller Plaza Galleries on June 3.

It is stated that the perfection of the five hundred or more works of color photographic art in the exhibit have all been made possible through the solving of color problems by research chemists of the dye industry working in cooperation with Barker Devin, of the Devin Colorgraph Co., sponsors of the show.

• BOOK ON HOSIERY

The new, illustrated, 128 page book, entitled "Hosiery Dyeing and Finishing," just published by the Onyx Oil & Chemical Co., Jersey City, N. J., is said to bring to hosiery mill executives, dyers and finishers one of the most complete and valuable technical compilations ever attempted on the subject. Approaching a text book in its appearance, size and contents, the new book gives comprehensive information and working data on the production of every type of hosiery, in all fibers.

Beginning with a history of silk, the book continues with a thorough, step-by-step evolution of silk, from silkworm to stocking, covering the biological formation of silk, chemistry and structure of raw silk, throwing, knitting, boil-off, dyeing, dulling, spotproofing and finishing.

The book is divided into two parts. Part one covers all-silk full fashioned hosiery. Part two covers "utility hose," which includes all other types of hosiery, half-hose and socks in silk, rayon, wool, cotton and unions. Completing the contents are an instructive article on pH control; descriptions of terms used in the industry; complete reference tables of weights, measures, chemical equations and charts, together with illustrated views of the Onyx Hosiery Service division and new general laboratories.

The book is obtainable by responsible hosiery mill men and hosiery merchandisers, upon request on their firm letterhead, giving title or position.

• JOINS FULTON CO.

Announcement is made of the appointment of Daniel J. Graziano as vice-president and technical director of the Fulton Dye & Import Co., Inc., 250 West Broadway, New York City. This company is sole agent in the United States for the French chemical trust consisting of the Compagnie Francais de Produits Chimique et Matieres Colorantes du Nord Reunies Etablissements Kuhlmann, Societe Anonyme de Matieres Colorantes et Produits Chimiques de Saint-Denis, Societe de Produits Chimiques et Matieres Colorantes

de Mulhouse, and Compagnie Francaise de Produits Chimiques et Matieres Colorantes de Saint Clair-du-Rhone. Mr. Graziano is a graduate of Pratt Institute in technical chemistry and has had considerable experience in demonstrating to the textile trade. He was with the Calco Chemical Co. for 14 years as supervisor of the application research laboratories, resigning that position to become the vice president and sales manager of the Phoenix Color and Chemical Company.

● CIBA REVIEW

Copies of *Ciba Review*, Number 20, April, 1939, featuring "The Development of the Textile Crafts in Spain" has recently been distributed. Contents are described by the following titles: Outstanding Dates in Spanish History; Europe and Spain; The Development of Wool Weaving in Spain; The Development of Silk Weaving in Spain; Tapestry Weaving and Carpet Knotting in Spain; Historical Gleanings. Copies of this publication are available upon request to the Ciba Co., P. O. Box 25, Station C, New York, N. Y.

● GEIGY RELEASE

Geigy Co., Inc., 89 Barclay St., New York City, announces release of a pamphlet describing the following product:—

Erio Fast Floxine 2 G L—a further addition to the Geigy range of Erio Fast Floxines, it being the yellowest and brightest of the group. As in the case of the older B L and 3 B L Supra brands, this new product is said to be distinguished by its level dyeing properties and its very good fastness to light. It is stated that this color should be of particular interest to plants looking for a fast-to-light, level dyeing red for ladies' dress goods, wool hats, knit and carpet yarns. It can be used not only as a self shade but also as the red component in combination shades. It is stated that it is practically unaffected by chrome; cotton and rayon effects remain clean and silk is only slightly stained. Circular No. 885.

● GENERAL RELEASES

General Dyestuff Corp., 435 Hudson St., New York City, announces release of the following circulars and sample cards:—

Prints with Celliton, Celliton Fast and Celliton Discharge Dyestuffs on Acetate Rayon—forty-two brands are illustrated in two depths of shade; recipes and fastness properties of the colors are also given. Sample card No. 1552.

Celliton Discharge Dyestuffs—this card shows twenty-three dischargeable Celliton brands in three depths of shade on acetate rayon with white discharges; the card also gives the principal fastness properties of the colors which are illustrated and it shows, furthermore, combination shades, especially browns, greens, navies and blacks also white discharged. Sample card No. 1594.

Fastusol Green L 6 B L—a straight product, producing fine bluish greens said to be of superior fastness to light. It is stated that the product has very good solubility, levels well and discharges clear with an alkaline paste. It is said to be well suited for dyeing mixed fabrics of cotton and rayon or wool and spun rayon; acetate rayon remains clear. Circular No. 1566.

Supranol Blue G G—a new acid blue which is said to combine very good fastness to light with very good fastness to wearing and processing. It is further said to level well from a weakly acid bath and possess a very good fastness to washing, water, perspiration, sea water and stoving. Its fastness to milling, carbonizing and decatizing is said to be good. Therefore, it is suitable for slubbing and loose wool. The fastness to stoving makes the product of value for blankets. It also dyes very well from a neutral bath. Circular No. 1611.

Algol Yellow 4 G F Paste—a new vat dyestuff which yields bright greenish yellow shades and is said to have very good fastness to washing and chlorine. It is recommended by the manufacturers for the application to cotton in all stages of its manufacture and particularly for package machine work on account of its good solubility and level dyeing qualities. Circular No. G-171.

● SOCMA MEETING

The regular monthly luncheon meeting of the Synthetic Organic Chemical Manufacturers Association was held at the Chemists' Club, New York City, on Tuesday, April 11th, 1939. The secretary reported on current items of interest to the members.

● FALL FABRICS FORUM

Parents' Magazine announces that it will hold an infants' and children's wear fall fabric forum on Tuesday, May 23, at 3:30 p.m., in the Crystal Garden Ballroom of the Ritz-Carlton Hotel, New York City. A comprehensive collection of new fabrics of wool, cotton, rayon and silk will be shown. Advance information concerning what colors will be popular for fall will be available. Tickets are available from *Parents' Magazine*, 9 East 40th St., New York City.

● M.I.T. SUMMER COURSE

Announcement is made of the fourth special summer program in theoretical and applied chemistry and physics of matter in the colloidal state to be held at the Massachusetts Institute of Technology for five weeks, beginning July 24, 1939. The course is under the direction of Dr. E. A. Hauser. The course will consist of lectures, round-table discussions, practical training in laboratory and research work and is offered to men actively engaged in industry or research and to graduate students.

CLASSIFIED

GESUCHT
DRUCKEREI-KOLORIST

schweizerischer Nationalität, Akademiker bevorzgut, mit vieljähriger Praxis auf dem ganzen Gebiet des Zeugdruckes. Sprachgewandt in Deutsch, Französisch, Englisch. Anmeldungen mit Lebenslauf, Zeugnisabschriften und Referenzen an Chiffre. . . . Write Box No. 175, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Dyestuff Salesman and Demonstrator, now employed, desires to make change. New England territory preferred. Salary secondary, will consider South. Write Box No. 181, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Plant chemist. Graduate Lowell Textile Institute, 1929. Three years' laboratory and demonstration experience with large dyestuff concern. Six years' experience as chief chemist of dyeing and finishing plant. Also four and one-half years as chemical purchasing agent. Familiar application and testing of all types of textile dyestuffs. More than average ability for trouble-shooting. Age 34. Married. Now employed. Location immaterial. Write Box No. 182, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Chemical Engineer experienced all phases of the manufacture of sulfonated oils. Knows tanning, textile and other industrial specialty oils. Have had research, executive and sales experience. Age 35—white—American—will go anywhere. Write Box No. 183, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

QUALITY AND PRODUCTION EXECUTIVE FOR FINISHING PLANT: Practical executive with twenty-eight years' experience in both northern and southern plants, practical dyer and finisher, has succeeded in assisting several plants back into profitable operation, seeks connection with plant desirous of modernizing methods and reducing costs. Successful in keeping labor relations on friendly basis. Write Box No. 184, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.